2015 Program for Celebrating Scholarship & Creativity Day

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Benedicta Arts Center Escher Auditorium, CSB

Art

Art Dept. (Rachel Melis, Alicia Peterson, Art) Chalk Talk

Wing Young Huie, a prominent Minnesota photographer who makes work about identity and contemporary urban societies (with an emphasis on diverse immigrant communities), will be conducting a creative workshop for students from four area high schools and our students and staff. The event will begin with a talk that’s open to the entire campus community about Wing Young Huie’s own path exploring his own identity and the world around him through photography. He will then give a workshop called “Chalk Talk,” http://www.wingyounghuie.com/store, which helps students form small groups to discuss, photograph, and display (in real time via social media, and, later, in a gallery show) issues and images related to identity. Our students will walk away with having heard an inspiring presentation, and having collaborated on a creative project about identity that intentionally strives to combat stereotypes and help students understand themselves and each other more fully.

Benedicta Arts Center Gallery Lounge, CSB

Art

Sean M. Donohue, Autumn R. Flynn, Nicole A. Pederson, Madison L. Ames, Amanda J. Baloun, Maggie C. Eli, Victoria K. Hernandez, Maria E. Knudson, Bao Lao, Va Lor, Kate E. McGrath, Briana I. Plantenberg, Elizabeth S. Silverman, Jessica M. Sprague, Amanda J. Urbanski, Ong Xiong (Andrea Shaker, Art)
Intermediate Photography and Computer Art

Exhibition of works by students of Intermediate Photography and Computer Art

Benedicta Arts Center Student Gallery, CSB

Art

Angel Aguilera, Mara Bauer, Sean Donohue, Johanna Jutz, Andrew Kinnan, Andrew Macaitis, Hannah Neilson, Nicole Pederson, Eric Reichert, Callie Stark, Jeanette Thornton, Sarah Wachter, Shuting Zhang (Elaine Rutherford, Art)
Drawing in Space Installation

Drawing in Space is a collaborative installation work by students from Art 119 (3D/Drawing). It is an environmental drawing which occupies the
space of the student gallery At CSB. Students will discuss their process of creation and collaboration in the making of this large scale environmental piece.

_Clemen's Library Creative Media Lab, CSB_

**First Year Seminar (FYS)**  
Taryn Kranick, Jamie Weekley (Mary Jane Berger, First Year Seminar (FYS))  
**Benedictine Values Through The Student Eye**

Our video entitled, Benedictine Values Through The Student Eye lasts four minutes. We filmed the Benedictine Values that are found on the Saint Ben’s and Saint John’s campuses. Random students were selected during passing times and were asked about the four main values represented on campus: Awareness of God, community living, common good, and hospitality.

_Clemen's Library Creativity Media Lab, CSB_

**First Year Seminar (FYS)**  
Mark Hanowski, Ben Klaphake (Mary Jane Berger, First Year Seminar (FYS))  
**The Benedictine Values: A Community in Action**

We feel these Values, given to us by St. Benedict, provide a model and guide to living a holy, spiritual, and productive community-based life. This five minute video features interviews and mock-interactions of some of the people part of this Benedictine Community.

Aimee Hanson, Chelsea Schwarzkopf (Mary Jane Berger, First Year Seminar (FYS))  
**Benedictine Values Video**

Our video “Benedictine Values” presents the values outlined in the Rule of Benedict that we feel are most important to the CSBSJU community. Created over the course of several days with assistance from the Creative Lab, we interviewed people across campus to help tell the story.

Allie Pybas (Mary Jane Berger, First Year Seminar (FYS))  
**Benedictine Values at CSB/SJU**

Allie Pybas  
Billy Menor  
_Benedictine Values at CSB/SJU (0:3:41)_
When coming to The College of Saint Benedict and St. Johns University, we noticed and were taught the importance and influence the Benedictine Values have. The colleges here at CSB/SJU were built on the Benedictine Values and we wanted to demonstrate the ways in which students practice and see the values in our everyday life.

_Clemen's Library Gallery Lounge, CSB_

**Media Services**
Megan L. Boettcher (Adam Konczewski, Media Services) Women in Videography

Extending the Link's (ETL) Videographers, Bao Khang and Megan Boettcher, will present on their experiences of being female videographers in a predominantly male profession. They will speak to the industry in general (past and present), Extending the Link's history, as well as the organization's present and future. They will also touch on their hopes and apprehensions as they contemplate their future in videography. There will also be a viewing of the trailer for ETL's current film, Obbasaín gállit: We Continue, which they will be showing later today.

_Clemen's Library Media Creativity Lab, CSB_

**First Year Seminar (FYS)**
Olivia Busch, Olive Hogan-Stark (Mary Jane Berger, First Year Seminar (FYS))

Morals for the Modern Millennial

Our film, Morals for the Modern Millennial, highlights the foundational Benedictine Values that we see around our CSB/SJU communities. By interviewing faculty members and students concerning their ideas on the Common Good, Stewardship, and the Dignity of Work, we hope to encourage fellow Bennies and Johnnies to lead bold lives of servant leadership.

Samuel Olson, Charlie Raasch (Mary Jane Berger, First Year Seminar (FYS))

Saint Benedict and His Values

We believe the Benedictine Values to be not only the core of the Religious Communities but to be the keys to a healthy life for everyone in society. Our video takes the simplicity of Benedict and his values and portrays them in a simple style.
Charles Schuweiler, Matthew Hobby (Mary Jane Berger, First Year Seminar (FYS))
The Life and Miracles of Saint Benedict

We decided to create this video in the manner that we did because we wanted to capture the attention of the young generation while providing the powerful themes and meanings found within the life of Saint Benedict. We wanted to depict the miracles that Saint Benedict performed because we believe that his Benedictine Values are seen on the campuses of the College of Saint Benedict and Saint John’s University.

Emily A. Webster, Anna M. Lahti (Mary Jane Berger, First Year Seminar (FYS))
Breaking News: The Benedictine Values are seen on CSB/SJU Campuses

This short video shows how the Benedictine Values are lived out on the CSB/SJU campuses. This video is in the format of a newscast that finds examples of Benedictine values on each campus. For those who do not know much about St. Benedict there is a brief background followed by examples of each value. The video also interviews students around campus. The interviews ask the students where they see the values being lived out on campus. Overall the news segment is a tool to give quick information about St. Benedict and his values that we take pride in here at The College of St. Benedict and Saint John’s University.

Gorecki Center A, B & C, CSB

Biochemistry
Emmanuela Bonglack (Alicia Peterson, Biochemistry) The PI3K-AKT pathway does not regulate Myc oncoprotein levels in KRAS mutant pancreatic cancer cells

Ras and Myc are both oncogenes which have been subjects of intense research due to their important roles in the development of many human cancers. The Ras proteins function as a hub of intracellular signaling, transmitting activation signals from cellular receptors toward signaling pathways such as the PI3K/AKT, Raf/MEK/ERK networks and many others. Myc is a transcription factor also mediating the control of many important cellular events such as cell cycle progression, cell death, and metabolism. Ras is found mutated in nearly 95% of pancreatic ductal adenocarcinomas (PDAC, the most common form of pancreatic cancer), emphasizing the important role it plays in this cancer. This, together with substantial experimental evidence has led scientists to the conclusion that the Ras protein is one of the most important therapeutic targets for PDAC. However, up to date no promising strategies have been developed to inhibit
its activity. Therefore, research has focused on defining the genes and proteins regulated by Ras with the hope of identifying potential therapeutic targets in Ras-driven cancers. We identify as such candidate the Myc oncogene. Myc protein levels are elevated in PDAC cells and we show that both Ras and Myc play crucial roles for the in vitro growth of human PDAC cell lines. Moreover, Ras maintains Myc protein levels in these cells. Since Myc is also currently an ‘undruggable’ oncogene, defining the mechanisms by which Ras maintains Myc levels in PDAC cells could pave the way for therapeutic strategies. Previous studies from other laboratories have implied that the PI3K/AKT pathway regulates Myc protein stability by affecting GSK3β activity. Therefore, we investigated whether inhibition of this pathway in KRAS mutant human PDAC cells would affect Myc protein levels. PDAC cells were treated with PI3K/AKT inhibitors, protein lysates were generated, and western blotting was used to analyze protein levels. We found that pharmacologic inhibition of PI3K and/or AKT did not cause Myc protein loss or significant PDAC cell growth reduction. This indicates that the pathway does not play a significant role in maintaining myc protein levels in PDAC cells, thereby suggesting the possibility of other K-Ras effector pathways playing a role in maintaining myc protein stability in KRAS mutant pancreatic cancer cells.

Center for Global Education
Ochirbat Bayanjargal (Dianne Johnstone, Center for Global Education) Global Internship

Wellmei is one of the top plastic and mold injection companies in China. The company produces electronic components, specialized parts for Computer, Automobile, Home Appliances and Industrial Parts since 1988. Wellmei serves customers in North America, Europe, and Asia. During the summer of 2014, I interned as a sales and marketing assistance at Wellmei. Through my work abroad experience, I gained a better idea of how international businesses work on a different set of environment. At the same time, I built more connections around the world and developed better understanding of my future career.

Diana Elhard, Diana Elhard, Justin Markon, Justin Markon, Bridget Barry, Bridget Barry, Erin Kelso, Erin Kelso (Joy Ruis, Joy Ruis, Center for Global Education) Millennial Identity within the U.S. and India

During our semester abroad in Kolkata, India, the country was preparing for a national election. Inspired by the political climate, we conducted a research project focused on identifying different attitudes towards state and
national identities among college students. Our project focused on a comparison between two groups of students: one from the U.S. and one from India. Questions were based around political engagement and participation. Additionally, we sought to understand how the different party systems effected the participation of the students in each group. We greatly enjoyed the opportunity to be exposed to another style of democracy through our study abroad program.

Diana Elhard (Dianne Johnstone, Center for Global Education) Youth involvement in Bosnia and Herzegovina

During the Summer of 2014, I interned with the Archdiocesan Center for Youth Ministry John Paul II in Sarajevo, Bosnia and Herzegovina. I primarily worked at camps that sought to provide an inclusive living environment for children of the three main ethnic and religious groups in Bosnia and Herzegovina. The most significant experience during the internship was working with the youth to do volunteer projects in their local communities. With elder generations often disconnected from the youth in the country, these volunteer projects help to sew positive seeds within each generation. This poster will highlight some of my experiences from the summer and some of the projects completed by the youth I worked with.

Mary Franz (Joseph Rogers, Center for Global Education) A Summer in Bosnia and Herzegovina

As a fellow for the Center for Global Education’s Summer Global Internship Program in 2014, I traveled to Bosnia and Herzegovina where I had the opportunity to study, work, and volunteer abroad. I worked for a local NGO, Udruzenju Sunce Mostar, who’s mission is to improve the quality of life for people with disabilities through social protection, rehabilitation, job training, and employment. During my internship, I learned about the social structures that contribute to the discrimination of individuals with mental and physical disabilities in Bosnia and assisted a team of volunteers who provide care and educational workshops for the NGO’s clients. I also volunteered at a local kindergarten where I researched and facilitated activities to aid in the development of children with special needs while assisting teachers in daily education and activities for students. My poster details the experiences I had working and volunteering in Bosnia and explores the lessons, development, and transformation I experienced while participating in the program.
My presentation will discuss the cultural difference I encountered during my semester abroad in France. My semester began with learning how to properly pronounce the French “r” to full conversations with vendors in Paris. Along the way I explored several cities and made lasting friendships, while continuously questioning the world around me. Through calling to question the French culture, I became more aware of the influence that my Mexican-American culture has had in my life. Yet, as the semester progressed I found myself drinking more espressos and craving less tortillas. Overall, I hope to bring insight to what study abroad looked like for me and inspire others to challenge their cultural experiences.

Consuelo Gutierrez (Dianne Johnstone, Center for Global Education) Intern for the Fundación Mahatma Gandhi

The internship in the Dominican Republic with the Fundación Mahatma Gandhi provided an opportunity to engage in a full immersion of the Dominican culture by directly working with a community organization, La Union de Juntas de Vecinos De Las Terrenas, in order to learn about community development. As interns we were able to experience four different living experiences during our eight week stay. This allowed us to observe the range of living experiences in the Dominican Republic while also allowing us to engage with different people and learning about their hopes for their country. Interns planned and ran summer camps for children in one of the smaller communities and here they focused on hydration, hygiene, nutrition, and taking care of the environment. Through these community projects, interns were able to gain an understanding of the depths of the culture in the Dominican Republic and the effort that goes into trying to implement changes in a community.

Stefanie M. Havemeier (Dianne Johnstone, Center for Global Education) La República Dominicana

The silky sands, towering palm trees, and mesmerizing waves flank the notorious Dominican shoreline. While the Dominican Republic is rich in beauty, it is also vibrant with history, culture, and a dynamic social economy. Six students from the College of Saint Benedict and Saint John’s University journeyed to the Dominican Republic for a two-month, full immersion internship with La Fundación Mahatma Gandhi in Las Terrenas. Together, interns lead summer camps through the foundation
with an emphasis on hygiene, art and creativity, music and nutrition. Additionally, with the help of José Bourget, founder of La Fundación Mahatma Gandhi, interns were introduced to La Union de Juntas de Vecinos De Las Terrenas, an organization dedicated to community development. During their stay in the Dominican Republic, interns rotated housing, which exposed students to multiple socioeconomic conditions. Through this program, interns learned how to adapt to a changing environment, accept a new culture, be open to unpredictable circumstances, and appreciate a collective of small actions contributing to a larger picture.

Marina Kitazume (Nichole Matuska, Center for Global Education) Differences Between Life in Japan and Minnesota

Have you ever studied abroad? Yes, I have! I’m a very lucky person because I have a chance to come to Minnesota and study at CSB/SJU. I’m enjoying studying here. I’ve met many people and had many experiences. I’m from Japan, so I realized many differences between Japan and Minnesota. Some of the differences are related to culture shock and they have been difficult to understand. Even now it makes me confused. In this presentation, I will show the differences in school life, clothes, humor, food, and relationship with people between Japan and Minnesota. These differences are very good experiences and only people who have studied abroad could know them. I would like to share this with many people. It has been a good opportunity to know a different culture and it has been very interesting. These differences make me different and I feel that I have become a different person.

Jessica Raboin (Joy Ruiz, Center for Global Education) German Federal Employment Agency: A Summer Internship Experience

The Federal Employment Agency is the largest provider of labor market services in Germany, with over 700 agencies, an institute for employment research, international placement services, a university, leadership academy, and family benefits office, among other subdivisions. The agency is publically-funded and has several integral responsibilities: job and apprenticeship placement, career counseling, employer services, professional integration of people with disabilities, and services for the unemployed. My interest in career counseling, labor market management and social services spurred my interest in interning at the German Federal Employment Agency. I independently arranged an internship for summer 2014 with an agency near Munich, Germany. This poster will outline the departments I
worked with, the outcomes I learned from this experience, and the organization in general. I will also touch on some of the knowledge I gained about business German and etiquette.

Jacob Shawback (Joseph Rogers, Center for Global Education) Summer Global Internship Program - Dominican Republic

A poster presentation on the 2014 Dominican Republic Summer Global Internship Program. Topics to be discussed include: working as a community development intern at Fundación Mahatma Gandhi (FMG), job shadowing at Guzmán Ariza law firm, leading a youth leadership retreat, and living a home-stay. The presentation will provide information on the 2014 cohort’s projects at FMG, professional development and internship opportunities available in Las Terrenas, and the educational benefits of the program. Photos of the various internship sites, projects, and accommodations will be included on the poster. Finally, the relationship between FMG and CSB/SJU will discussed in terms of the developed partnership between the two institutions and communities.

Kathrine Tillman (Dianne Johnstone, Center for Global Education) Summer Global Internship: Bosnia and Herzegovina

During the summer of 2014 I lived and worked in Bosnia and Herzegovina through the Center for Global Education’s Summer Global Internship Program. While in Bosnia I worked for the Entrepreneurship Center at the University of Banja Luka. This poster presentation includes a summary of my internship placement and primary responsibilities as well as an explanation of the main reasons I chose to seek an internship to Bosnia.

Jill E. Valerius, Jill E. Valerius, Lydia F. Ogren, Lydia F. Ogren (Joy Ruis, Joy Ruis, Center for Global Education) Living in Italia and Greece

Italy and Greece have two vastly different, but unique cultures. There are so many things that make each individual country fascinating to live in. This presentation offers a snapshot of our experience living in both of these countries for a semester. Specifically, we were captivated by the differences in education, communication, and social behaviors compared to what we have learned in the United States. We fell in love with the positive values both populations have and getting to experience these cultures has enhanced our experience at the College of Saint Benedict and Saint John’s University. As study abroad ambassadors, we will share our personal
experiences about the challenges and successes we learned while living, studying, and interacting with the Italian and Greek population.

Chemistry
Claire E. Buysse, Faith E. Kersey-Bronce (Chris Schaller, Chemistry) The Selectivity of the Baeyer-Villiger Oxidation Reaction

The broad application of polyurethane materials in consumer products like apparel, automobiles, and electronics makes them a target for improved sustainability. Recent efforts to boost sustainability have included finding starting materials that can be derived from natural products and modified under mild conditions. This research centers on the conversion of dihydrocarvone, an orange peel derivative, to dihydrocarvide, which can be utilized as a renewable starting material in polyurethanes. To effectively convert the dihydrocarvone carbonyl into a dihydrocarvide ester, it is essential to understand the selectivity of the Baeyer-Villiger oxidation under mild reaction conditions. To do so, dihydrocarvone and three additional substrates (with varied sterics, alkene placement, and alkene substitution) were tested with a variety of oxidative reagents. We found the use of different substrates largely affected the selectivity of the reaction for the ester or epoxide product, which may help us better understand the competition between the Baeyer-Villiger oxidation and epoxidation and how to control it.

Claire E. Buysse (Kate Graham, Chemistry) Materials for Organic Electronics: Synthesis of 2,3-dihexyl-5-(trimethylstannyl)thieno[3,4-b]pyrazine

Conjugated polymers have recently garnered much attention for their electronic properties, which mimic the semiconducting properties of inorganic materials while providing many of the benefits of organic plastics. These polymers offer a greater degree of processibility, as well as lower production costs, making them instrumental in the development of flexible electronic materials. Of particular interest are polymers with low bandgaps and previous research has centered on the synthesis of such polymers through the enhancement of their quinoidal nature or the application of a donor-acceptor polymeric framework. This research focuses specifically on the synthesis and properties of a thieno[3,4-b]pyrazine-benzothiadiazole dimer, a new donor-acceptor pairing that has the potential for application as a new low bandgap material. If proven effective, this would provide a new design approach to low bandgap polymers and would contribute to our deeper understanding of the donor-acceptor polymeric framework that dominates current low bandgap research.
There has been growing interest in the synthesis of chiral hydroxyalkanephosphonates for use as precursors for other reactions or as analogs of biomolecules. The hydroxyalkanephosphonate can be synthesized by the enantio and diastereoselective additions of alkyl phosphites and alkanes. New ways are needed to produce these hydroxyphosphonates as precursors for other reactions. This work involved the synthesis and purification of a hydroxyphosphonate from diethyl phosphate and crotonaldehyde. The ultimate goal was to make an epoxide. The purification of the hydroxyphosphonate from diethyl phosphate was difficult. New ways to purify the phosphonate product were conducted. The first attempt involved the use of a silica gel column using 100% ethyl acetate as the solvent to elute the hydroxyphosphonate. A drying oven and vacuum pump were used to remove the remaining diethyl phosphate impurity. This research will set the stage for finding more ways of synthesizing epoxides for other reactions or analogs of biomolecules from the hydroxyphosphonate.

References:

Nanoparticles are useful in applications including synthesizing medicinal products that require crossing the blood brain barrier, creating rigid materials such as nanoparticle-strengthened steel, and developing stronger lighter materials. Nanoparticles are increasingly important in making advances in the medical and chemical world. Hence, it is imperative to develop easier and more efficient ways of synthesizing nanoparticles. We report a simple synthesis and assembly of Cu2O nanoparticles into wires, cubes, and octahedrons, via Fehling’s reaction. The experiments were successful in creating nanoparticles, but shapes produced were cubes and octahedrons rather than the expected tubules. Analyses of the nanoparticles...
and their assembled structures were done through Scanning Electron Microscopy (SEM) and Dynamic Light Scattering (DLS).

Thomas M. O'Toole (Thomas Jones, Chemistry) Synthesis of N-Propargyl Amino Acids

In organic synthetic chemistry, amino acids provide a cheap and reliable stereocenter that can be used to synthesize chiral molecules such as pharmaceutical precursors and natural products. To expand the uses of amino acids in synthesis, the ability to add a variety of functional groups to different positions on the molecule is key.

Here, we propargylate amino acids at the amino group to form N-propargylamines through the addition of 3-(Trimethylsilyl)-2-propynal to the selected amino acid methyl ester hydrochloride, with the methyl ester serving as protection for the carboxylic proton. The solution is reacted in methanol and triethylamine to produce an imminium, which is then selectively reduced with sodium borohydride to yield the N-propargylamine. The new propargyl group can expand the synthetic possibilities of the molecule and could possibly serve as a nucleophile to attack the amino ester carbonyl electrophile to eventually form cyclic products such as indolizidine or pyrrolizidine.


Little is known about alkyl thiocyanates and their ability to form self-assembled monolayers (SAMs). A SAM is composed of a cyanate head attached to a layer of gold, with alkyl chains rising vertically from the surface. On a larger scale the alkyl chains would look like shag carpet. The goal is to get the alkyl chains tightly packed and facing the same way. The alkyl chains interact through Van Der Waals forces; these interactions ultimately determine how well ordered the surface is, as they impact how tightly packed the alkyl chains are. It is our goal to test these interactions and find the best conditions to create thiocyanate SAMs. In order to characterize a SAM on a molecular level, we used a scanning tunneling microscope (STM). An STM is a device that scans the surface with the use of a platinum-iridium tip and a voltage. The tip scans the surface in a forward/backward motion, translating the electrical signals into an image of the surface. Octylthiocyanate was synthesized by reacting potassium thiocyanate and octyl bromide in ethanol in a single vessel. The product was characterized with IR, 1H-NMR, and 13C-NMR. After synthesis, the thiocyanate was used to create a SAM using a solution-based method.
Synthesis of thiocyanates and characterization of the SAMs will be discussed.

Kiarah J. Ray (Kate Graham, Edward McIntee, Chemistry) Reverse Phase

Reverse Phase liquid chromatography (RPC) is a well-known separation technique used in many different fields of science. This is one of the techniques used in the College of Saint Benedict’s 202 Chemistry Lab. This lab would be improved if a wider variety of separation mixtures could be developed. The goal of this experiment is to find additional “unknowns” that could be used in future 202 labs at CSB/SJU. Four different potential unknowns were tested- (4-Nitrophenol, 4-Nitroaniline, 4-Nitrobenzoic Acid, and 2-methyl-4-Nitroaniline). Results showed that 4-Nitrophenol and 4-Nitroaniline are not ideal together since they had an almost identical mass, so it would be difficult for a student to identify one from the other. A methyl group was added to the 4-Nitroaniline, making it 2-methyl-4-Nitroaniline. All four compounds would make great additions to the 202 lab, but additional test would need to be run to finalize the additions.

Katlin T. Schmitz (Henry Jakubowski, Chemistry) Synthesis of Potential Inhibitors for Low Molecular Weight Protein Tyrosine Phosphatase

Protein phosphorylation/dephosphorylation is critical to cellular signaling. Altered activity of one enzyme involved in dephosphorylation, low molecular weight protein tyrosine phosphatase (LMW-PTP), has been linked with several types of cancer. As a result LMW-PTP has become the target of strategic new therapeutic agents to fight several diseases. Hence, there is a need for new inhibitors for the enzyme LMW-PTP and for the study of its activity. This research sought to successfully synthesize and test two candidate inhibitors from aniline and 4-aminophenylactic acid. Synthetic products were purified and analyzed by NMR. Mechanism and results will be discussed.

Gao H. Yang, Alex Madsen (Kate Graham, Thomas Jones, Chemistry) Synthesis of Epoxides from Hydroxyphosphonates

Abstract:

There has been growing interest in the synthesis of chiral hydroxyalkanephosphonates for use as precursors for other reactions or as analogs of biomolecules. The hydroxyalkanephosphonate can be synthesized by the enantio and diastereoselective additions of alkyl...
phosphites and alkanes. New ways are needed to produce these hydroxyphosphonates as precursors for other reactions. This work involved the synthesis and purification of a hydroxyphosphonate from diethyl phosphite and crotonaldehyde. The ultimate goal was to make an epoxide. The purification of the hydroxyphosphonate from diethyl phosphate was difficult. New ways to purify the phosphonate product were conducted. The first attempt involved the use of a silica gel column using 100% ethyl acetate as the solvent to elute the hydroxyphosphonate. A drying oven and vacuum pump were used to remove the remaining diethyl phosphate impurity. This research will set the stage for finding more ways of synthesizing epoxides for other reactions or analogs of biomolecules from the hydroxyphosphonate.

References:


Exercise Science and Sport Study
Charles G. Broback, Sarah A. Roehl, Samuel J. Scoblic (Donald Fischer, Exercise Science and Sport Study) The Effect of Leg Dominance on Dynamic Postural Stability

Research studies utilizing the Dynamic Postural Stability Index (DPSI), a commonly used method to assess an individual’s ability to transition efficiently from a dynamic to static state, typically analyze dominant leg (DL) and non-dominant leg (NDL) DPSI values separately. Purpose: To compare DL and NDL DPSI values to determine if there are significant differences in mean scores, which could justify the practice of examining DL and NDL values separately. Methods: Thirty-two healthy and physically active subjects [16 males (19.8 ±1.3 years, 85.6 ±13.0 kg, 180.3 ±18.9 cm) and 16 females (20.2 ±1.0 years, 64.8 ±20.4 kg, 165.2 ±11.2 cm)] completed 20 jumps, landing on one leg on a force plate. Ten jumps were performed in the anterior direction (5 landing on the DL and 5 on the NDL) over a 30 cm hurdle at a distance equal to 40% of body height. Ten
jumps were also performed in the lateral direction (5 landing on the DL and 5 on the NDL) over a 15 cm hurdle at a distance equal to 33% of body height. Ground reaction forces in the x, y, and z directions, sampled at 200 Hz, were used to calculate DPSI values in each of the four conditions. Data was analyzed using dependent t-tests. Results: Dependent t-tests revealed no significant differences between mean DPSI values for the DL (0.350 ±0.06; 0.314 ±0.06) compared to the NDL (0.353 ±0.05; 0.312 ±0.05) when landing from an anterior and lateral jump respectively (t(31) = -0.429, p = .671; t(31) = 0.148, p = .883). Additionally, the effect size differences between the DL and NDL were found to be small when landing from the anterior (d = 0.05) and lateral jump (d = 0.03). Conclusion: The non-significant differences in the means and the small effect sizes indicate the DPSI values associated with DL and NDL when landing from an anterior and lateral jump are similar. Therefore, the determination of leg dominance may not be necessary when evaluating dynamic postural stability using the DPSI.

Matthew T. Hanowski (Donald Fischer, Exercise Science and Sport Study) Using Social-Cognitive Theory to Promote Dental Health in School-Aged Children

As part of the Capstone to the Individualized Natural Science – Integrative Health Science major, I completed an internship at Falls Court Dental Office. Included in the internship was an outreach intervention intended to promote dental health in school-aged children. The intervention was developed based on a review of literature and primarily utilized Social-Cognitive Theory for the theoretical framework. A summary of the intervention and the outcomes will be presented.

David Kahat (Mary Stenson, Exercise Science and Sport Study) The Effect of Static and Dynamic Stretching on Vertical Jump and Agility Performance

Static and dynamic stretching are often used to help prepare for sport or activity. However, research examining the effect that different stretching protocols have on agility and vertical jump performance remains inconclusive. The purpose of this study was to examine the effect of static and dynamic stretching protocols on countermovement jump (CMJ) and Illinois Agility Test (IAT) times. 9 recreationally active males between ages 18-22 (178.76 SD=2.74 cm, 75.74 SD=16.32 kg, 9.62% SD=4.81% body fat) completed this study. Participants began each session with a 400m jog, then performed one of three stretching protocols. The stretching protocol for each session was chosen in a randomized order. Following the completion of the stretching protocol, subjects completed three CMJs, then
completed the IAT 3 times. The best of the three trials for CMJ and IAT was used for data analysis. Mean IAT times were 16.72s (SD=1.28), 16.53s (SD=.95), and 16.43s (SD=.88) for the control, static, and dynamic stretching protocols respectively. CMJ heights were 65.12cm (SD=16.32), 64.56cm (SD=7.74), and 65.02cm (SD=8.71) for the control, static, and dynamic stretching protocols respectively. A one way repeated measures ANOVA was used to test the data for significance. No significant differences were found within subjects for IAT (F (2,16) = 2.31, p = .13) or CMJ (F (2,16) = .14, p = .875). The lack of difference between treatments may have been due to too much time immediately following protocols, therefore negating any benefit that would result from the stretching protocol. While no significant differences were found between IAT and CMJ performance with different stretching protocols, this does not necessarily mean stretching protocols are equally advantageous for jump and agility performance. Further research is needed to understand the benefits of different stretching protocols on agility and vertical jump performance. Research examining power and agility performance immediately following stretching protocols, or stretching protocols with stretches held for longer durations may yield different results.

Megan E. Lawson (Mary Stenson, Exercise Science and Sport Study) The Effects of Ankle Bracing on the Performance of the Dynamic Postural Stability Index

Introduction: Dynamic postural stability is the ability to maintain stability when transitioning from a dynamic to static state. Dynamic postural stability can be measured using the Dynamic Postural Stability Index (DPSI), which is calculated using its directional components Anterior-Posterior Stability Index (APSI), Medial-Lateral Stability Index (MLSI), and Vertical Stability Index (VSI). With evidence that ankle bracing can enhance ankle proprioception, ankle bracing may enhance performance during DPSI testing because dynamic balance relies on proprioception and somatosensory feedback. Purpose: Because prophylactic ankle bracing is common in sport and exercise, it is important to understand how it may impact dynamic postural stability. The purpose of this study is to determine if prophylactic ankle braces have an effect on DPSI values. Methods: Seven males (20.14 ± 0.89 years, 81.44 ± 13.92 kg, 180.96 ± 4.58 cm) and 24 females (20.54 ± 0.72 years, 64.39 ± 8.79 kg, 164.74 ± 6.57 cm) who were physically active and had not worn an ankle brace in the last five years completed the DPSI test protocol. The protocol consisted of three jumps, each landing with the dominant foot on an Accupower force platform. Subjects jumped a distance that was 40% of their height, and over a 12 inch hurdle. One trial was completed without an ankle brace on and
another was completed with a brace on the ankle of the dominant leg.

Average DPSI, APSI, MLSI, and VSI values for each trial were used for data analysis. Results: A paired samples t-test was used for data analysis. No significant difference between braced (0.086 ± 0.011) and non-braced (0.087 ± 0.015) conditions was found for average APSI values [t(30) = -0.46, p > .05]. No significant difference between braced (0.036 ± 0.014) and non-braced (0.036 ± 0.013) conditions was found for average MLSI values [t(30) = 0.00, p > .05]. No significant difference between braced (0.310 ± 0.0395) and non-braced (0.030 ± 0.043) conditions was found for average VSI values [t(30) = 1.33, p > .05]. A nonsignificant difference between braced (0.325 ± 0.039) and non-braced (0.319 ± 0.044) conditions was found for average DPSI values [t(30) = 1.25, p > .05].

Conclusion: Wearing an ankle brace has no effect on the performance of the DPSI. Ankle braces will neither enhance nor inhibit dynamic postural stability.

Margaret M. Paul (Mary Stenson, Exercise Science and Sport Study) Characterizing Weightlifting Participation in College Aged Women

Weight bearing activity is an important component of overall health. According to the CDC (2007), only one third of women aged 18-24 obtain sufficient levels of physical activity, making them a particular concern. Many women may lack knowledge of proper weightlifting techniques, have incorrect information about weightlifting or have time constraints that prevent them from participating. PURPOSE: To determine if and why college aged women participate in or withhold from weight training methods. METHODS: 249 college-aged women were surveyed and 12 of those women participated in small focus groups. RESULTS: 57.8% of women were in the "normal" BMI category. Survey participants indicated that they were mostly "healthy" or "very healthy" (82.4%). Despite being an active sample, (88% indicated that they were either "active" or "very active"), less than half of respondents indicated that they participated in weightlifting either "often" or "very often". Additionally, 27.7% of women agreed, strongly agreed or were neutral when answering the statement, weightlifting is unnecessary when I am being physically active. Women reported the top three factors that motivated them to participate in weightlifting were to stay in shape, it made them feel good and it improved how they looked/the way they felt about their body. For women who faced obstacles when trying to include weightlifting into their workouts, time constraints seemed to be the largest barrier. It is possible that women place a great deal of emphasis on aerobic exercise and thus, lack time to add weightlifting to their exercise routine. CONCLUSION: Though the
reported activity levels in this sample were encouraging, an effort should still be made to address misconceptions and a lack of education surrounding weightlifting, especially in college aged women. More health and fitness education may help college students shift their attitudes and feel more empowered about adding weightlifting to their exercise routines. Campus-wide campaigns with high visibility tactics that deliver more than one component, such as educating and programming, have the potential for causing positive behavior change. Efforts such as these could be useful strategies in increasing the levels of participation of women in weightlifting on college campuses.

Morgan N. Potter (Mary Stenson, Exercise Science and Sport Study) Relationship between BMI, Exercise and Milk Consumption

Purpose: Research on the relationship between dairy consumption and BMI and percent body fat has been inconsistent. Additionally, there is minimal research on the relationship in American adult populations. Methods: 169 males and 344 females in a small college community were surveyed about their beverage consumption and exercise habits. Participants were 34 ± 15.6 years old with 45% of the participants between the ages of 18 and 22. On average, the participants consumed 10.6 ± 12.6 oz of milk (low fat, reduced fat, and whole milk) per day, with 79.1% of participants drinking only low fat milk. Results: A Pearson correlation revealed an inverse relationship between the consumption of milk and BMI (r = -0.104, p = 0.019), and a positive relationship between consumption of milk and minutes of exercise per week (r = 0.179, p < 0.001). Females also had an inverse relationship between milk consumption and BMI (r = -0.150, p = 0.005). Males had a stronger positive correlation between milk and minutes of exercise per week (r = 0.219, p = 0.004) than females (r = 0.152, p = 0.005). A sub sample of the participants (40 males, 58 females, 28 ± 12.3 years, 14.1 ± 16.5 oz milk per day) volunteered for body composition testing with bioelectrical impedance. In this smaller sample, body fat was significantly and inversely related to milk consumption (r = -0.313, p = 0.002). Milk consumption was also significantly positively related to physical activity (r = 0.307, p = 0.002). Conclusion: Regular exercise and some properties of milk, such as calcium, may play a role in regulation of fat metabolism. Further, individuals who partake in one healthy behavior are more likely to partake in multiple healthy behaviors, such as exercise and healthy eating which can help maintain healthy body consumption.
Melissa A. Seldon, Benjamin F. Hodapp (Donald Fischer, Exercise Science and Sport Study) The Relationship between Ground Reaction Force and Softball Pitch Velocity

Since the ground is the only external contact for a softball pitcher, ground reaction force (GRF) is theorized to be an important factor in determining softball pitch velocity, yet little research examining this relationship has been published. Purpose: To examine the relationship between the GRF of the stride leg and softball pitch velocity. Methods: Three right hand dominant female Division III intercollegiate softball pitchers (18.3 ±0.6 years; 72.1 ±1.6 kg; 168.0 ±7.9 cm) performed 15 maximal velocity fastball pitches into a net, landing on a force plate with their stride leg, during two separate test sessions (total of 30 pitches per pitcher). Ball velocity was measured to the tenth of one mile per hour using a Stryker radar gun and converted to meters per second. Peak vertical and braking GRFs, sampled at 600 Hz, were normalized to body weight (BW). The slope of the vertical and braking GRFs were calculated by dividing peak GRF by the time from ground contact, defined as the first upward deflection in GRF greater than 5% body weight, to peak force. A Pearson correlation was used to examine the relationship between GRF variables and ball velocity for all 90 pitches. Results: A significant positive correlation was found between ball velocity (23.5 ±0.9 m/sec) and vertical GRF (1.680 ±0.486% BW; r(90) = .854, p < .001), breaking GRF (1.096 ±0.231% BW; r(90) = .696, p < .001), slope of the vertical GRF (31066 ±15952 N/s; r(90) = .294, p = .005), and slope of the braking GRF (12296 ±5457 N/s; r(90) = .535, p < .001) of the stride leg. Conclusion: When a softball is pitched for maximal velocity by Division III softball pitchers using their normal mechanics, there is a positive relationship between GRF variables and ball velocity. Further research is needed to determine whether altering pitching mechanics to accentuate GRF variables will result in greater pitch velocity.

Selamawit Shannon-Tamrat (Janna LaFountaine, Exercise Science and Sport Study) Service Learning Experiences

Service Learning was one of the greatest experiences I have ever had. I did my 20 of hours service learning for Sport Ethics class at Kennedy Kidstop. In Sport Ethics we discussed many ethical perspectives, such as deontology, consequentialism, utilitarianism and teleological moral theories. All of which I have seen in action at Kennedy while helping students with homework and engaging in sports and other games. My experience of interacting with the children and staff has helped me further my understanding of strategic reasoning, egoistic behaviors, sportsmanship, and
the different gender attributes evident in sport. Some of these characteristics could be seen while the children attempted to cheat in order to win at all cost, particularly when playing dodge ball. I may have helped change lives, but they have also changed my life as well.

**Experiential Learning & Community Engagement**

Austin J. Barkley (Angela Whitney, Experiential Learning & Community Engagement) 2014 Jackson Fellowship - Anna Marie’s Alliance

Student spent last summer at Anna Marie’s Alliance in St. Cloud working as a Child Advocate. Anna Marie’s mission is "to provide a safe place for victims of domestic abuse and to achieve systems change that reduces violence." Student observed the challenges facing victims of domestic violence, conducted intakes, gained techniques for working with children with emotional and behavioral disorders, and served as a positive male role model for children and women. Student also assisted with the creation of programming and facilitated children’s classes.

Ellen M. Black (Angela Whitney, Experiential Learning & Community Engagement) 2014 College of Saint Benedict Marie and Robert Jackson Fellow

Children’s Dental Services (CDS) was founded in 1919 with the mission to improve the oral health of both children and pregnant women by providing affordable care. As an intern at CDS, 2014 Jackson Fellow, Ellen Black, a Biochemistry major, worked on a project for the Minnesota Department of Health, gained clinical and shadowing experience, and assisted in the daily functions of the clinic. This opportunity confirmed her desire to become a dentist. Student will share her experience as well as serve as an advocate for the Jackson Fellows Program.

Sarah Evans (Angela Whitney, Experiential Learning & Community Engagement)
Will Steger Foundation and Steger Wilderness Center- Jackson Fellows

As a 2014-2015 Jackson Fellow, student interned with the Will Steger Foundation (WSF) in Minneapolis, MN and Steger Wilderness Center in Ely, MN. WSF strives to educate and empower people to engage in solutions to climate change. While there, fellow helped to create an educator’s guide for the 2014 National Climate Assessment, which was later published on Climate.gov. The Steger Wilderness Center is built to be a living example of ecological stewardship and a demonstration center for devising new solutions to climate change. At the Center fellow gained
experience in the art of masonry and developed an understanding for the importance of environmental stewardship.

Mary R. Gilbertson (Angela Whitney, Experiential Learning & Community Engagement) Marie and Robert Jackson Fellows- Office of Senator Al Franken

Student interned at the Office of Senator Al Franken in Saint Paul, Minnesota, during the summer of 2014 as a member of the College of Saint Benedict Marie and Robert Jackson Fellows Program. U.S. Senator Franken works to serve all Minnesotans, regardless of political, economic, or social standing. This opportunity allowed for the student to gain experience in constituent services. Furthering her professionalism, writing and communication skills, as well as government understanding, the student will share her experiences and advocate for the Jackson Fellows Program.

Allison A. Kanyetzny (Adia Zeman, Experiential Learning & Community Engagement) Foster Grandparent Program- Bonner

Central MN Foster Grandparent Program is a program through Catholic Charities for seniors ages 55 and above to volunteer in their community while earning a non-taxable second income or stipend. Many of them volunteer at local schools or non-profit organizations. “Annually, over 200 Foster Grandparents serve 8,000 children across Central Minnesota. They share their wisdom and experience by mentoring kids who might not otherwise receive the extra attention they need to thrive”, (CatholicCharities). Foster Grandparent Program is amongst many work-study opportunities through the Bonner Leader Program. The CSB/SJU Bonner Leader Program is a 4-year program that includes scholarship, service, and community engagement. The mission of the program is, “Through sustained partnerships with colleges and congregations, the Corella and Bertram F. Bonner Foundation seeks to improve the lives of individuals and communities by helping meet the basic needs of nutrition and educational opportunity”, (CSB/SJU).

Mariya L. Lawinger (Angela Whitney, Experiential Learning & Community Engagement) College of Saint Benedict Marie & Robert Jackson Fellowship Program: Children’s Theatre Company

Student had the opportunity to intern at Children’s Theatre Company with the support of the College of Saint Benedict Marie and Robert Jackson Fellowship Program. Children’s Theatre Company provided an open,
creative, and professional environment for student to learn more about the Twin Cities' vibrant and thriving arts sector. Through this, student developed a better understanding of how to engage those communities without access to the theatre, as well as the tools needed to create a world-class theatre experience. Student will share her experiences in hopes of promoting a better understanding of these issues and to serve as an advocate for the Jackson Fellows Program.

Jamie McCarthy (Adia Zeman, Experiential Learning & Community Engagement)
How Bonner Works at CSB: Campus Ministry

College of Saint Benedict Campus Ministry's Spirituality and Social Justice Team reached out and impacted the lives of more than 3000 people in the last semester. From the Justice Walking Service Group to monthly Urban Plunges and various other events, SSJ as a whole has had a substantial effect on the local community and the people we serve. With the focus on social justice and local community work, SSJ is a great partner with the Bonner Program. Both groups are focused on giving back, whether through Hunger and Homelessness Awareness Week's Hunger Banquet to donating blankets to the Heartland Girls Ranch and everywhere in between.

Kenedy A. Meyer (Adia Zeman, Experiential Learning & Community Engagement) The Bonner Leader Program at Discovery Elementary

Discovery Elementary is a school with many diverse students. It is apparent how the school embraces these differences and is able to appreciate them within all of the students. At Discovery, many efforts are also made to provide financial help to those who may be struggling. The school does this by arranging after-school programs and offering both breakfast and lunch to the students. The presenter will share her experiences working in a kindergarten classroom at Discovery through the Bonner Leader Program. Additionally, other CSB/SJU partnerships with Discovery, such as the Flex it Forward program, will be highlighted.

Kaileigh Nicklas (Angela Whitney, Experiential Learning & Community Engagement) Summer Days at CMSD

This poster is a representation of my experience at the Children's Museum of South Dakota during the summer of 2014. This experience was made possible through my involvement in the Marie and Robert Jackson Fellows. I will speak about how I was involved in my community both in Brookings
and at CSB/SJU over the summer, and how the experience impacted my academic, professional, and personal life.

James T. Pathoulas, Eric D. Boysen, Laura L. Backus, Andrea E. Betts (Laura Hammond, Experiential Learning & Community Engagement) Mayo Innovation Scholars Program

The Mayo Innovation Scholars Program offers an opportunity for selected undergraduate science and business students from CSB/SJU to research projects submitted by Mayo Clinic professionals. After six months of scientific research and market analysis, participants offer a recommendation to the Mayo Clinic. This poster presentation will illustrate the experience of this year’s Mayo Innovation Scholars Program participants.

Leah Ranta, Justin Markon, Katy Smith, Katherine Maguirre (Adia Zeman, Experiential Learning & Community Engagement) Bonner Leader Program

The Bonner Leader Program is a social justice and service program where selected students are awarded a scholarship to continue service during their college career. Senior Bonner Leaders will be explaining the mission, model, and expectations of program members as well as their senior capstone projects.

Meg Schrafft (Adia Zeman, Experiential Learning & Community Engagement) Bonner Advisory Board

The Bonner Leader Program provides access to education, and the opportunity to serve for college students across the United States. As a part of an initiative to connect colleges across the network, the Bonner Foundation created the Bonner Advisory Board in 2009. Nine students from the network serve as liaisons between current Bonner Students and the Foundation. The presenter will discuss her role as a Bonner Advisory Board member in 2014-2015, as well as the history of the board, and the various project Bonner Advisory Board members completed during their term.

Jake Schultz (Laura Hammond, Experiential Learning & Community Engagement) My Eichten Experience

Last summer I had the fortunate opportunity to intern at one of my dream workplaces: Minnesota Public Radio (MPR). My poster presentation will
shed some light on this unforgettable experience and allow me to share the passion I felt then and now about the field.

Ashleigh N. Walter (Angela Whitney, Experiential Learning & Community Engagement) 2014 Jackson Fellowship Experience - West Side Community Organization

Student will presenting on experiences gained as a Jackson Fellow working with St. Paul’s District Council serving the West Side neighborhood, the West Side Community Organization (WSCO). WSCO aims to advance local-level community engagement through providing resources to advance community development planning, food security, youth leadership, and coalition building on civic issues. Fellow worked with WSCO’s food justice project, and coordinated the production of a neighborhood-wide community cookbook, as well as outreach campaigns for the West Side farmers market and food security study on culturally-appropriate and SNAP/WIC-friendly food resources in the West Side district.

Chendan Yan (Angela Whitney, Experiential Learning & Community Engagement) 2014 College of Saint Benedict Marie and Robert Jackson Fellow - Center for Earth Energy and Democracy

Center for Earth Energy and Democracy was founded by a group of researchers, educators and community activists who saw the need to affirm and revitalize principles of democracy and social justice. CEED’s mission is to work at the intersection of energy, environment and community development to develop solutions that are democratic, sustainable and socially just. As a mapping tool student researcher at CEED, 2014 Jackson Fellow Chendan Yan, an Environmental Studies and Philosophy double major from Shanghai, China, contacted agencies, collected, and analyzed data for Environmental Justice (EJ) Mapping tool. She developed Infographics demonstrating disparities among neighborhoods and created visual images for marketing purposes. She also analyzed data from community energy survey, prepared PowerPoint for Morris Climate Dialogue, and developed ideas for CEED website narratives.


In the spring of 2014, I was selected for one of ten spots in the CSB Marie and Robert Jackson Fellows program to lead civic engagement work
devoted to improving community life through service activities. Each fellow serves at a community site for the summer. I served at Northwest Hennepin Human Services Council in Brooklyn Center, MN as an Early Childhood Intern. I created and published 12 monthly Working Toward Success’s e-newsletters in Publisher that are sent to 2000 local employers in Northwest Hennepin County. They are currently used by the organization on their website: NWHHSC.org. I also contacted over 20 organizations to provide me with free resources they have pertaining to early childhood. With their help, I was able to establish 400 resource bags to be distributed to the community in Brooklyn Park, MN. For Scholarship and Creativity Day, I will have one of the resource bags I distributed to show and a poster to tell the audience more about what I accomplished over the summer and my takeaway as I graduate this May.

Mai Tong Yang (Laura Hammond, Experiential Learning & Community Engagement) MPR Gary Eichten Fellowship

Minnesota Public Radio offered two student fellowships for College of St. Benedict and St. John’s University for the summer of 2014. The fellowship awarded $5,000 to each student including full-time internships in the MPR newsroom with special mentorship by Gary Eichten. During my time as an Eichten Fellow learned the basics of news writing, reporting, and production, with a focus on writing for newscasts. One of the main features of this fellowship was writing our own feature news story. The news story was aired on radio and received front page coverage on the MPR’s news webpage. This is a great opportunity for anyone who is interested in radio, journalism, news writing, and communication career!

Biruk Zekewos (Angela Whitney, Experiential Learning & Community Engagement) College of Saint Benedict Marie & Robert Jackson Fellowship

Program: United Living Community

United Living Community (ULC) Child Development Center (CDC) is a childcare facility open to children ages four weeks to 6 years. The CDC offers a unique setting for care and learning through an inter-generational environment that brings together the children and seniors of United Living Community. Student intern worked cooperatively with teachers from CDC and activity staff from the retirement center to develop summer and fall activities that promote inter-generational relationships. Intern also organized a teddy bear clinic for the children in the day care center by developing a partnership with the community health center.
Integrative Health Sciences
Patrick Godfrey (Manuel Campos, Integrative Health Sciences) Compensatory Review for Strokes: Case Study Addressing Similar Diagnoses and Treatments

This case study evaluates the challenging clinic steps for diagnosing strokes and treatment options. Strokes occur in the brain after a blood vessel ruptures or becomes occluded. The various symptoms stemming from the dysfunctional blood vessel can present similar to Bell’s Palsy requiring careful clinical evaluation. Treatment options for strokes further complicates the controversy with strokes.

Mathematics
Steven Carik, Seung Choi, Gino Delmont, MacKenzie Flickinger, Yu Hao, Sam Hassel, Ben Heath, Annette Klomp, Cheng Lee, Stephanie Leuer, Shilei Lin, Martin McGuire, Alex Miller, Emily Nagel, Ryan O’Gorman, Jihoon Park, Kim Patterson, Joseph Praus, Jordan Schulze, Michael Tipping, Brandon Voigt, Alex Wald, Denny Wasson, Tyler Weiss, Rachel Wolfe, Stephanie Zabinski, Casey Zins (Anne Sinko, Mathematics) Applications of Linear Algebra

Linear algebra is an important mathematical field, but it also appears as a tool in a wide variety of applications across numerous fields. Used extensively as a foundation in mathematics, linear algebra can also be found in physics, chemistry, computer science, economics, art, and cryptography, just to name a few. The posters from the spring semester linear algebra class each present a different application of linear algebra, either to mathematics or other fields including the application and how linear algebra plays an important role in that application. Applications will include Google search, input-out models, image compression, color spaces, genetics, stoichiometric calculations, GPS, and cryptography.

Nursing
Rebecca DeNio, Alexandra Alviani (Rachelle Larsen, Nursing) Quality Improvement: Optimizing Wound Prevention and Treatment

A concern over increasing incidence of pressure sores was noted at a local long term care facility. In order to address this issue, students in their immersion experience reviewed existing literature on prevention and treatment of pressure ulcers and performed chart audits. Areas identified for further intervention included turning/repositioning of patients, adequate nutrition, correct dressing changes, daily hygiene, and wheelchair cushioning. A poster was developed to address these identified areas to provide staff from each discipline education to improve care of pressure
ulcers and offer suggestions for prevention of future pressure ulcers. This quality improvement plan will help to prevent wound development in the vulnerable older adult population, leading to improvement in the quality of life and health of the residents at this facility.

Christopher Dirkes, Tess Foster (Luann Reif, Nursing) Lavender Aromatherapy and its Effect on Pain Management

For hundreds of years, aromatherapy has been utilized and accepted by many cultures as a natural way of healing. Traditionally, aromatherapy has been identified to help facilitate sleep, alleviate pain, decrease stress, as well as a number of other uses. Recently, there has been an increased presence of aromatherapy in the healthcare setting. The aim of this project is to examine the best practice evidence in order to implement the use of aromatherapy, specifically lavender, in the Long Term Care setting on a transitional care unit for pain management. Research has been conducted on the benefits of aromatherapy versus pharmacological pain management as well as the best practice administration techniques. Included in the discussion will be a brief history of aromatherapy, the specific chemical makeup of lavender, the role of the olfactory system in the alleviation of pain, side effects of current pain management options and future implementation recommendations for the use of lavender in the alleviation of pain.

Kaitlyn Grausam, Sabrina Weber, Kendall Uribe, Nick Johnson (Carrie Hoover, Nursing) Non-Pharmacological Pain Management

Chronic pain is a prevalent problem in the older adult population. In long term care facilities there are frequent reports of pain. Often staff rely solely on the administration of pain medication to relieve pain in the elder patient. In addition, many of the residents are taking scheduled pain medication in addition to what may be needed for breakthrough pain. Pain medication can cause a wide range of adverse side effects such as dizziness, constipation, organ damage, and increased confusion. These side effects may lead to falls, acute delirium, and constipation. This demonstrates a need for non-pharmacological therapies to compliment or replace pain medications to manage pain and avoid potential side effects. This project aims to identify evidenced-based non-pharmacological interventions to reduce the use of pain medications, limiting the risk of side effects to the elder resident.
In response to a quality improvement opportunity at a local nursing home, we looked into whether the use of a resident-centered care template would be an effective non-pharmacological intervention that can be implemented in a long-term care facility to decrease dementia-related behaviors and subsequently the use of antipsychotic drug use. Our purpose is to give staff a new resource for decreasing behaviors related to dementia by educating them on non-pharmacological interventions that they can use. By educating staff on the use of a resident-centered care template, we aim to eventually decrease the need and use of antipsychotics because of their potential harm to the elderly and their low effectiveness.

We plan to provide a non-pharmacological intervention by providing staff with a resident-centered care template. This template will consist of questions that allow the staff to get to know the resident better. We plan to implement this education through a PowerPoint presentation that explains how the template works and the benefits it provides for resident-centered care. To evaluate our education plan, we will ask staff to complete a short follow-up survey to evaluate how comfortable they feel implementing the use of the resident centered care template.

We predict that educational PowerPoint will be feasible to implement. The resident-centered care template will be easy to implement into everyday practice even with the time constraints of a long-term care facility.

We would view this intervention to be successful if the staff report in the post-education survey that they feel it is feasible for them to implement at least one aspect of the resident-centered care template once per shift.

The purpose of this quality improvement project is to improve infection control and prevention within the long term care facility. Based on observation, data collection, and discussion with staff, the following problems were selected to be the focus of this project. These main processes include hand washing/isolation precautions, UTIs (7-8 per month), and proper handling/cleaning of equipment. Many of the protocols regarding these areas are out of date and not universally known by the staff. This lack of education and resulting practices increase the risk of infection among the residents and staff at the long term care facility. The goal of this project is
to decrease the development and spread of infection by providing education as well as protocols on infection control and prevention.

Brianna Knutson, Sarah Bellissimo, Brittney Schlueter (Rachelle Larsen, Nursing) Enhancing quality care through a plan of correction

The Minnesota Department of Health reviews long term care facilities yearly to ensure patient safety and quality of care. Surveyors assess for potential deficiencies; the facility then has ten days from the time of submission of the deficiencies to complete a plan of correction. A small local nursing home underwent department of health review and the following deficiency areas were identified: liability notice, incontinent status, pressure ulcers and wheelchair positioning, chair positioning, correction of pain through restorative programming, inability to prevent further decline regarding range of motion, fall prevention, food temperature, and infection control planning. In order to create a plan of correction to address these deficiencies, student nurses reviewed patient files, observed patients in their environment, collaborated with an interdisciplinary team, and used evidence based practice research articles to formulate interventions. The Minnesota Department of Health accepted the developed plan of correction which included audit worksheets and education in-service for the staff at the facility.

Nicole Ramler, Patricia Indrelie, Rachel Pollard (Julie Strelow, Nursing) Prevention of Rehospitalization

The aim of this project was to assist in reducing the prevalence of rehospitalization from a tertiary care setting. The most common risk factors associated with re-hospitalization include the following: history of heart failure, chronic obstructive pulmonary disease, urinary tract infection, falls and pneumonia. There is a large increase in the population age 65 and older. Within this population there is also an increase in the prevalence of chronic illnesses. These comorbidities have been linked to an increase in the number of re-hospitalizations. Research has provided possible solutions in reducing re-hospitalization rates within this demographic.

Brian R. Schlichting, Alex E. Funk, Arnel C. Lungay (Luann Reif, Nursing) Effectively Communication with patients with Dementia

Dementia is a general term. There are many different types of dementia, and it is defined as a progressive irreversible syndrome. It generally means a memory loss and a constellation of other symptoms, usually involving
language disturbance, motor skills deficits, reasoning and processing declines. One in three individuals die with a form of dementia (Alzheimer’s Association). The manifestations resulting from the disease hinder the provision of care by the nursing staff, and are the root cause of barriers to meeting the patient’s needs. These communication and sensory barriers often lead to unsafe behaviors that threaten the safety of both the resident and staff. Recent studies indicate the need for improvement in the area of geriatric care, particularly in memory care. This presentation outlines the overlooked differences of caring for patients with dementia, where caregivers can improve when caring for these patients, and what evidence has deemed to be best practice.

Carrie Schoeberl, Hayley Enfield, Brita Skalbeck (Rachelle Larsen, Nursing) Urinary Tract Infections in Older Adults

During review of the Quarterly Minnesota State Quality Indicator Report, a local long term care facility identified an increase in urinary tract infections amongst its residents. Urinary tract infections (UTIs) are the most common bacterial infections found in older adults (Bazaldua, 2001). In long term care facilities, residents with UTIs have poorer outcomes and staff experience increased workload. From the patient perspective, those with an infection can experience the urge to urinate, burning during urination, frequently urinating, pelvic pain, possible changes in mental status and confusion (Vorvick, 2013). The goal of this quality improvement project is to decrease the incidence of UTIs acquired in the long term care facility. In addition to creating/updating current policy, an in-service will be provided to educate staff regarding interventions to decrease the incidence of urinary tract infections.

Tara Serbus, Evan Guffey, Mitch McGraw (Gary Gillitzer, Nursing) Pain Management in a Nursing Home Facility

The facility where we developed our quality improvement project has both a long-term care center and a transitional care center, with a combined census of 115. Our project focused on pain management and the reduction in reported levels of pain. This topic was suggested to us due to high levels of reported pain at their facility. The high reported levels of pain was supported by a tool used in nursing homes called a CASPER report (Certification and Survey Provider Enhanced Reporting). A CASPER report is a data set that compares all long-term care facilities across the nation. The CASPER report retrieves data from the Minimum Data Set (MDS) assessment tool. This tool is completed, at minimum, on a
quarterly basis for all residents. The two categories within the CASPER report that were significant to us was the reporting of moderate to severe pain for short-term residents (length of stay less than 100 days), and the reporting of moderate to severe pain for long-term residents (length of stay equal or greater than 100 days). In order for a resident to trigger within one of these categories, they would have to report a pain level of six or higher on a pain scale, ranging from zero to ten, within the last five days.

On the most recent CASPER report, which was surveyed for the months of November, December, and January of 2014, it was reported that 32 of the 83 short-term residents at had flagged for moderate to severe pain. This accounted for a facility-adjusted percentage of 38.6% of the short-term patients experiencing high pain levels. The Minnesota state average within the same category was 22.8% of residents and the national average was 18.7%. This placed the facility in the 91st percentile in comparison to other long-term care facilities in the nation. For long-term residents, it was reported that nine out of 48 reported moderate to severe pain within the allotted period. This resulted in a facility-adjusted percentage of 12.1% of the residents flagging for moderate to severe pain. The Minnesota state average of other facilities was 9.9%, and the national average was 7.7%. This placed the facility at the 78th percentile for their high pain reports in long-term residents.

The goal is to have both short-term and long-term pain reporting levels at or below the 70th percentile in comparison to the national average. Due to the high reports of pain on the CASPER report we decided to investigate why there were so many reports of high pain levels in the facility, and explore how we could improve pain management while decreasing the reported numbers of moderate to severe pain.

Emma Steck, Hannah Chartier (Luann Reif, Nursing) Nosocomial Urinary Tract Infection Prevention

A common problem in long term care facilities is a high number of nosocomial urinary tract infections. In order to improve quality and patient safety, the number of infections needs to be decreased. There is an opportunity for improvement within perineal care on a daily basis and how it is completed by the nursing staff. There is also an opportunity for improvement with the diagnosis of UTI's in older adults specifically.

Potential problems associated with UTI's are often improper perineal care, improper diagnosis of UTI's, improper treatment plan, improper catheterization procedure, and frequency of perineal care.
The current procedure for this facility with perineal care involves personal cleanser spray instead of soap and water. This aspect could potentially be a major contributor to the total number of UTI’s. A study was developed to test soap/water vs. the cleanser spray on one part of the long-term portion of the facility. A month long trial was conducted. Once results are in, analysis of which cleaning agent is more effective will determine future perineal care at the facility and potentially in other facilities.

Mackenzie M. Wenner, Sara J. Weill (Julie Strelow, Nursing) Therapeutic touch in the elderly population

Human beings are born with a desire for physical contact, and the feelings of touch and comfort. Those feelings do not disappear as we age. Although there are benefits to touch, long-term care facilities are seeing an absence of it between staff members and residents. The objective of this quality improvement project was to determine the best methods of therapeutic touch, and how to implement them in a long-term care facility.

Nutrition
Callie S. Neumann (Alexa Evenson, Mark Glen, Nutrition) MOBILE APPLICATION USE AND HEALTHY EATING BEHAVIORS IN YOUNG ADULT WOMEN.

In today’s society, obesity and chronic diseases are on the rise. Maintaining a healthy diet, a healthy weight and an active lifestyle are important steps in helping reduce the risk of chronic diseases. People are becoming increasingly interested in technologies that can help improve their health, many of which revolve around the use of a mobile phone. The popularity of mobile phone applications (apps) has been on the rise recently. The question of whether or not these phone apps increase healthy behaviors or positively impact body weight—particularly when compared to basic phone-based record keeping—and specifically in a college-age population has not been explored extensively, making this an important area to address and research. Participants (n=43) were randomly enrolled into a mobile app or phone-based memo group during a 6 week study. Participants in the app group were trained on proper usage of the free app, MyNetDiary, and the memo group received directions on how to journal their food and exercise activity on their phone. Participants were asked to complete pre and post questionnaires during the duration of the study. Physical Activity (PA), Physical Activity Change Strategies (PACS) and Health Behavior Change Strategies (HECS) were assessed via the Health Behavior Survey. The physical activity staging portion of the questionnaire was used to assess how
many days a week participants accumulated 30 minutes or more of purposeful physical activity per day. Dietary intake questions were from the validated National Health and Nutrition Examination Survey (NHANES) 2009-2010 Dietary Screener. Anthropometric data (including height, weight, waist circumference and BMI) was collected at baseline and completion of the 6 week study. Adherence to tracking dietary intake and physical activity was collected at three weeks and the conclusion of the study Comparisons between the App group and Memo group were examined using an independent samples t-test for continuous variables and a \( \chi^2 \) test of independence for categorical variables. A paired t-test was also used for assessing changes within the groups. Additionally, ANCOVA, with the baseline value of the dependent variable serving as the covariate, was used to assess change across 6 weeks for the PACS and HECS. A two-sided \( \alpha \) of 0.05 was applied. There were no significant differences found between or within groups in any area of dietary intake measured. No significant differences were found in frequency of obtaining at least 30 minutes of physical activity per day. Additionally, there was not a significant change in total scores for HECS or PACS. Strengths of this study include the use of a mobile phone in both groups, thus eliminating the confounding caused by variations in recording methodology. Additionally, adherence was assessed, which is often omitted in other studies. Finally, there is limited research in normal weight individuals using a mobile app and its effect on anthropometrics and health behaviors. This study attempts to begin to fill that gap. Limitations to the study could include the inability to generalize these findings beyond the relatively homogenous study population, which was predominately white female, normal weight, college students. The sample size and length of time for the study are also limitations. A larger population of subjects and a longer time-frame (e.g. 12+ weeks) may be needed in order to see a change in eating habits and physical activity behaviors in healthy young adults. Finally, giving focused dietary and physical activity targets prior to commencing recording might lead to more health-related changes, thus allowing for clearer discrimination between groups.

Bailey A. Weirens (Alexa Evenson, Nutrition) Eating Competence, Cardiovascular Disease Risk Factors, and Diet Quality in Young Adults

Background and Objective: Students transitioning from high school to college experience challenging changes, and some may be detrimental to their health. Diet is a very important aspect of a young adult’s life, and if unhealthy decisions are made regarding this area, risk for cardiovascular disease may increase. Cardiovascular Disease (CVD) is of primary concern
in young adults; as CVD is the leading cause of death in the U.S. for both males and females. Young adults are at a crucial time in their lives to recognize risk factors contributing to CVD and to modify their diets to prevent the onset later in life. Therefore, this study attempted to examine how eating competence (EC) is related to dietary intake of certain food groups and cardiovascular risk factors including lipid profiles, blood pressure, and fasting blood glucose.

Methods: Participants (n=68) were enrolled in an introductory nutrition course for non-majors. Participants’ lipid profiles, (Total cholesterol, LDL, HDL, and TG), blood pressure, and fasting blood glucose levels were collected as part of a laboratory exercise for the course. Lipid profiles were analyzed via Cholestec machine. Food group intakes were measured by a self-reported 3-day food record and analyzed using the SuperTracker website. Eating competence was assessed by the ecSatter Inventory (EcSI). T-tests were used to analyze differences in EC between males and females, and between EC and non-EC groups. Pearson correlation analysis was used to determine associations between EC, cardiovascular risk factors, and food group intakes.

Results: Of the total sample, 52.9% were classified as EC (EcSI > 32). Males and females that were EC were 57.1% and 46.9% respectively. Overall, the mean total EC score was higher for males than females at 33.3 and 30.6 respectively, although not statistically significant (p=.09). EC was significantly correlated with HDL (r=-.299; p=0.01) and DBP levels (r=-.285, p=.02). Food regulation subscale scores were significantly different between males and females (p=.01). There were no significant differences found between EC and non-EC groups for any variable. Overall, the sample means for TC, LDL, HDL, and TG were 160.9 mg/dL, 86.3 mg/dL, 56.5 mg/dL, and 101.4 mg/dL respectively. Between males and females, BMI (p=0.045) and HDL levels (p=0.029) were significantly different. Percentages of males not meeting the requirements for whole grains, fruits, vegetables, and dairy were 63%, 71.4%, 74.3% and 65.7% respectively. Percentages of females not meeting requirements for whole grains, fruits, vegetables, and dairy were 81.3%, 59.4%, 71.9%, and 81.3% respectively. Dairy intake was statistically different between males and females with males consuming more (p=0.03). Vegetable intake between males and females was trending (p=0.054) but was not statistically significant.

Conclusions and Implications: Although males had higher EcSI scores than females, they were not significantly different (p=.09). Significant differences in food group intake may be due to males consuming more kcals in general. The majority of the sample was not meeting requirements for any of the food groups measured. The majority of the sample was meeting...
normal or optimal cutoff levels for CVD risk factors. In addition, males had lower HDL levels which is consistent with previous research. Strengths of this study include this being the first study to examine healthy young adults (ages 18-23) in regards to a combination of EC, CVD risk factors, and food group intake analysis. Additionally, our sample size is larger than previous studies examining EC and CVD risk factors. Limitations of the study include the sample size which was still relatively small. The sample may not be representative of the 18-23 year old demographic as a whole, as this research was conducted at a small, private, Midwestern college. In addition, dietary intake was self-reported, and exercise was not included which may have other implications on CVD risk factors. Overall, nutrition education could be tailored to increase eating competence especially focused on food regulation components for females. Nutrition education in general could focus on meeting food group recommendations in this age group. More research is needed to fully understand EC and 18-23 year old dietary intake and CVD risk factors to potentially decrease the risk for CVD as one ages.

Office of Education Abroad
Michael Merrigan (Joy Ruis, Office of Education Abroad) The Culture of Food in Japan

In Japan, food is such a main part of their culture. A staple in the Japanese cuisine is fish. I was amazed at the many ways that fish was prepared while in Japan. One of the most common ways fish was prepared was in sushi. During my semester in Japan, not only did I try many different varieties of sushi, but I tried lots of new foods that I have never had before and it pushed me out of my comfort zone. In Japan, it was remarkable to see the care in how the food was prepared, the use of fresh ingredients, and the artistic presentation that accompanied each dining experience. With so many different types of food found in Japan, it took a while to get used to them, but I ended up really enjoying these foods, including fish. I also learned to make a lot of different foods during my time there, including how to roll my own sushi rolls, make Soba noodles, and other foods that mostly involved rice, which I now incorporate into my life back here in the US. Overall I really enjoyed my time and experiences in Japan and hope to return soon.

Gorecki Center Fireside, CSB

Center for Global Education
Diana Elhard, Diana Elhard, Justin Markon, Justin Markon, Bridget Barry, Bridget Barry, Erin Kelso, Erin Kelso (Joy Ruis, Joy Ruis, Center for Global Education) Millennial Identity within the U.S. and India

During our semester abroad in Kolkata, India, the country was preparing for a national election. Inspired by the political climate, we conducted a research project focused on identifying different attitudes towards state and national identities among college students. Our project focused on a comparison between two groups of students: one from the U.S. and one from India. Questions were based around political engagement and participation. Additionally, we sought to understand how the different party systems effected the participation of the students in each group. We greatly enjoyed the opportunity to be exposed to another style of democracy through our study abroad program.

Jaquelin Galindo, Jaquelin Galindo (Joy Ruis, Joy Ruis, Center for Global Education) A Semester in French Rivera

My presentation will discuss the cultural difference I encountered during my semester abroad in France. My semester begin with learning how to properly pronounce the French “r” to full conversations with vendors in Paris. Along the way I explored several cities and made lasting friendships, while continuously questioning the world around me. Through calling to question the French culture, I became more aware of the influence that my Mexican-American culture has had in my life. Yet, as the semester progressed I found myself drinking more espressos and craving less tortillas. Overall, I hope to bring insight to what study abroad looked like for me and inspire others to challenge their cultural experiences.

Jill E. Valerius, Jill E. Valerius, Lydia F. Ogren, Lydia F. Ogren (Joy Ruis, Joy Ruis, Center for Global Education) Living in Italia and Parthé

Italy and Greece have two vastly different, but unique cultures. There are so many things that make each individual country fascinating to live in. This presentation offers a snapshot of our experience living in both of these countries for a semester. Specifically, we were captivated by the differences in education, communication, and social behaviors compared to what we have learned in the United States. We fell in love with the positive values both populations have and getting to experience these cultures has enhanced our experience at the College of Saint Benedict and Saint John’s University. As study abroad ambassadors, we will share our personal
experiences about the challenges and successes we learned while living, studying, and interacting with the Italian and Greek population.

New Science Center 140, SJU

Psychology
Daniel A. Flesher (Rodger Narloch, Parker Wheatley, Psychology) The Interplay of Temporal Discounting and Happiness

Individuals tend to discount the future, meaning they value a reward more in the present than the same reward in the future. Research indicates there are several consequences to the rate one discounts the future, suggesting those who value the future more have better life outcomes. The relationship between the rate at which one discounts the future and the individual’s level of happiness was examined. The parameters of discounting were obtained by a stated indifference point for a given present value for a given time period in the future, using both money and periods happiness as hypothetical rewards. Furthermore, it was tested if knowing about the positive effects of valuing the future more affected how people made their decisions. Finally, different functional forms of discounting were analyzed.

New Science Center 146, SJU

Psychology
Lauren Alexander, Gaby Varela, Katie Cristan (Stephen Stelzner, Psychology) Service Learning Project, "A Night on Bourbon Street"

For our service learning project, we worked with the volunteer coordinators at St. Benedict’s Senior Community to help host a "night out" for the residents. This consisted of selecting a theme, a menu to go along with that theme, and performers to entertain during dinner. Together we chose a New Orleans theme: "A Night on Bourbon Street." There were about 45 guests invited, selected by the staff. The chef prepared a special dinner based on the theme. There were three different groups performing. Two CSB students sang and played the piano. The CSB/SJU student comedy group Attention Starved Children performed an improv show with three sets and an encore performance by request of the audience. Then, Johnnie Blend ended the night with four songs. Overall, the night was filled with laughter and smiles. We helped walk some of the residents out. Many residents repeatedly commented how much they enjoyed the night and proceeded to ask when the next event like this was! This kind of event is important for the community to provide exciting opportunities for
residents that they normally do not have the chance to attend in the Senior Center, which provides a more exciting and higher quality of life for these residents.

Caitlin Boran, Natalia Gall, Emily Boettcher, Racheal Yates (Stephen Stelzner, Psychology) KRP Parent Resource Book

As our project for the Service Learning aspect of our Community Psychology class, we have been working with LSS's Kids Resiliency Program (KRP). In order to promote a continuation of the program's goals and principles after the clients have left the program, we have created a Parent's Guidebook to give to parents at the completion of their child's time with KRP. The purpose of this guidebook is to provide the clients with another method of support and as a starting point on how to continue to enable their child's positive growth and development. It includes meal plans, family and community activities suggestions, emergency contact lists, meal-time talking points, and reward chart suggestions.

Timothy D. Immelman, Cullen T. McAnally, Dino V. Saracco (Stephen Stelzner, Psychology) Lutheran Social Services Service Learning

The purpose of the project was to design resources for Lutheran Social Services (LSS) to be used during their after school leisure activity program. The activities center around games we adapt to fit the needs and abilities of the kids. Those activities implement four separate goals: (1) working together, (2) communication, (3) following instructions, and (4) personal boundaries. We visited the site to learn the abilities and needs of the population, which includes children ages 10 to 13. We then learned about the resources and space available to us. After gaining an understanding of the capabilities of the children and the expected nature of the activities, we created games that incorporated the previously mentioned goals. Along with the goals, we were expected to create post-activity discussion points for each of the games. Once we had a sufficient number of leisure activities and games, we put them into one large Microsoft Word document in the format requested by the LSS supervisor. The packet was neatly organized into four sections consisting of games related to the specific goals. At the end of the project, we got the opportunity to lead some of the activities we created.

Lisa Smith, Catherine Walesch, Ben Purman (Stephen Stelzner, Psychology) Girl Scouts
For our service learning project, we were tasked with mentoring a Girl Scout troop - i.e., teaching them how to build positive relationships, set goals, and become leaders that can implement change. In addition, the project was designed to help them develop monetary and communication skills with the end goal of running a cookie booth. As time progressed however, it became apparent that working with the girls on the cookie booth was out of the picture. We will discuss some of the obstacles that led to a change in focus, including logistical issues and communication difficulties. We will also discuss progress on our revised goal, which is focused on the girls themselves and their personal growth. We hope to connect with the girls on a more intimate level and gain a better understanding of their community.

Samantha VanErp, Aaron Longtin, Eric Zuniga (Stephen Stelzner, Psychology)
WACOSA Service Learning Project

We were assigned to design curricula for the WACOSA program - an employment service for those with disabilities located in St. Cloud. The curricula focus on a wide variety of topics, including road signs, police, interviewing, dog safety, and using the library. Each curricular component includes information on the topic and different activities, such as flashcards, matching games, or worksheets that furthered learning with an interactive approach. Some packets included helpful tips or steps to completing a task, depending on the program topic. Each curricular component was designed to last about an hour. At the end of the semester we will have designed 3-4 different curricular packets.

Quadrangle 341, SJU

Philosophy

Nicholas P. Benson (Emily Esch, Philosophy) The Nature of a Musical Work

This presentation will be an exploration of the ways philosophers have attempted to define the musical work through time, paying particular attention to how these definitions stand with regards to the idea of musical Platonism.

Nicholas W. Hamel (Emily Esch, Philosophy) Educational Transformation, An Opening for Freedom

A commonplace notion of education is one that entails the absorption of information and knowledge by the pupil. While this view is simplified,
even complex theories of education operate on the foundational idea that the information of the world is taken into the established self. A challenge to this idea is the notion of the existential self in the context of education. This understanding of the self views the student as actively defined by where he or she stands in the context of the her world. Here, the student is building an understanding of self in the world as she encounters and incorporates information in the world. Within this educational process is an opening of possibility within the student, an opportunity for new beginnings through new understanding. This opening in the self is the introduction of positive freedom. It is through this transformation of self that a student may realize the possibility she contains and become more positively free in her understanding of herself. An exploration of this phenomenon, and all that it entails, seeks to prepare educators to pay heed to and facilitate this transformation within their students.

Thomas I. Hirschboeck (Emily Esch, Philosophy) The Ethics of Authenticity

My research will focus on the possibility of creating a normative ethics on the basis of existentialist authenticity (or an individually meaningful value-orientation toward the world). Since existentialism takes the individual to be essentially free and self-determining, this is often seen as an impossibility; total self-determination seems to lead directly to relativism. My argument is that, by reconceptualizing the concept of freedom to see the given world not as a limitation to the subject but as the basis for the possibility of intersubjective significance, it is possible to create a normative ethical model based on authentic, individualized value systems. I will illustrate this with a discussion of the case of Armin Meiwes, a German man who killed and ate the body of a consenting victim in 2001, arguing that a truly authentic ethical system would reject these actions as a closing of possibility.

Nicholas E. Minkel (Emily Esch, Philosophy) The Practical Meme

The study of memetics aims to add a secondary replicator to the common understanding of human evolution. In addition to a gene, the memetic standpoint is that memes (loosely defined as replicable ideas) interact and, indeed, interfere with genetic fitness and self-interest—traditionally considered to be the lone determinants of evolutionary processes. This paper discusses the foundations of meme theory, memetic evolution and how this process interrupts genetic favorability—distinguishing the meme by its own self-interest, as well as some of the issues facing memetics. Specifically, the approach is to examine the practical value of this study,
and this will be accomplished through a consideration of the necessity of discreteness, in regards to memes. The ambition here is to dismiss concerns that discredit memetic existence based merely on the likely truth that a heritage of memes may often prove difficult to obtain. The argument that postulates memetic ambiguity implies inexistence is ill conceived, and rashly defended. However, such indiscreetness may affect the ability to gain anything from such a study, which will, obviously, be contributive to its overall value. Patented technology will serve to show at least one area of interest where memetics may be able to provide us with useful, and hopefully unexpected, information.

Her Vang (Emily Esch, Philosophy) The Existence of the Soul

My research project will follow two historically well known Philosophers, Aristotle and Plato, as they use reasoning to prove the existence of the soul through the four causes and the forms. The four causes and the forms will be my argument for the existence of the soul as it contributes to the physical world as an immortal entity that is the essence of the physical body that it harbors. I will argue this through pure reasoning as the soul does have an important role in the physical world as the mover of all things. In addition, I believe that it is also important to understand the soul’s impact on the physical world if it does exist through Aristotle and Plato’s literature.

Tanner Wright (Emily Esch, Philosophy) Violent Retaliation in Sports

My research topic explores the ethical implications behind violent retaliation in sports. The main issues are when and if it is right to retaliate against a certain team or opponent for their actions. This issue is highly criticized in the philosophy of sport realm because it incorporates violent retaliation against another person. It is also controversial because the role of violence in sports is permeating into society. There are instances such as the Ray Rice and Adrian Peterson incidents which show that violent sports have a bleeding effect into player’s personal lives. Throughout my paper, I argue that violent retaliation is only acceptable in specific instances.

Tanner Wright (Anthony Cunningham, Philosophy) Lindmark Fellowship: Ethical Obligations in Literature

For my Lindmark Fellowship research project, I focused on the professional ethics behind authors and their literature. Specifically, I focused on the role that an author’s literature comments on morality in the world. Literature has the ability to trigger the emotions and bring certain moral truths to
fruition. I argue against Kant’s morality through reason as I believe that emotions can have an impact on our moral beliefs. In addition, I believe that literature helps us find a greater sense of morality because they affect our emotions and teach us through their narratives.

Chendan Yan (Emily Esch, Philosophy) Grounding an Appropriate Philosophical Foundation for Effective Environmental Policy

This thesis project carefully examines existing theories of environmental ethics that are categorized into three schools: the instrumental approach, intrinsic value approach and the relational approach. The work of leading philosophers representing each school will be discussed, among which existing work of the intrinsic value approach and relational value approach schools will be particularly focused on. Papers from J. Baird Callicott, a leading philosophical interpreter of Aldo Leopold’s land ethic, will be examined and used to discuss the intrinsic approach. Callicott’s work will be compared with the work of Marion Hourdequin, David. B. Wong and Gary E. Varner whose theories will be used to represent the relational approach. This paper suggests that Varner’s biocentrism individualism, with a theoretical foundation in the relational approach, can potentially provide an appropriate ethical foundation for effective environmental policy.
Fine Arts Presentations:

Theater

Schedule

10:00 - 10:30 AM  
*BAC Colman Theater*  
Laura Ricci, Teri Schafer (Kaarin Johnston, Theater)  
CRIMES OF THE HEART: A Senior Project Performance

10:35 - 11:05 AM  
*BAC Colman Theater*  
Daniel R. Green (Adam Houghton, Theater) Emotional Contagion: A Senior Showcase

11:05 - 11:35 AM  
*BAC Colman Theater*  
Jefferson D. Cunningham, Heidi M. Hurrle, Daniel R. Green, Joshua P. Fike (Kaarin Johnston, Theater)  
Kennedy Center American College Theater Festival Experience

Abstracts

**Ricci, Schafer:** Our aim was to produce Beth Henley’s CRIMES OF THE HEART as fully as possible in order to gain experience putting a production together from beginning to end and convey an important message to the audience. We chose CRIMES OF THE HEART in order to send this message to our audience: sisterly bonds transcend individual faults, bringing family--blood relatives and friends alike--together in unexpected ways and times. We feel that this is an important message at the College of St. Benedict as young women at this school meet each other and become like family to one another for their time here and long after graduation.

Throughout the summer we analyzed the script and researched the world of the play. In October, we held auditions and cast the roles. During the course of fall semester, we spent over 200 hours collaborating with the cast, crew members, a Stage Manager, a lighting technician, the faculty, and others to pull together all the elements of the production-- lighting, sound, props, costumes, a basic set, acting, directing, and advertising. From a blank stage to a realized production, we made decisions that professional directors are faced with, and every choice needed to ultimately aid in our message of sisterhood.

**Green:** Theater influences and is influenced by culture. Theater artists take inspiration from other fields of learning as well as make commentary on those fields.
As a double major in both theater and psychology I find this to be true. For my showcase, I wanted, in particular, to explore the emotionality and psychology of the actor and character so as to influence the audience’s experience. I selected challenging monologues and scenes which each highlight a specific emotion, and I paired these scenes with evocative lighting. This performance was a great challenge as an actor as well as a statement for the importance and practicality of theater in other fields of learning.

**Cunningham, Hurrle, Green, Fike:** The four of us had the opportunity to attend the Kennedy Center American College Theater Festival for one week in January. There, we participated in the Irene Ryan acting auditions as well as numerous theater workshops.
## Humanities Presentations:

### English

#### Schedule

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<thead>
<tr>
<th>Time</th>
<th>Room</th>
<th>Presentation Details</th>
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<tbody>
<tr>
<td>10:00 - 10:05 AM</td>
<td>Quad 347</td>
<td>Madeline Heroux (Rachel Marston, English) &quot;The Usual&quot; A Short Story</td>
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<tr>
<td>10:05 - 10:10 AM</td>
<td>Quad 347</td>
<td>Nicole M. Koonce (Rachel Marston, English) &quot;Paper Trail&quot; Creative Writing Excerpt</td>
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<tr>
<td>10:10 - 10:15 AM</td>
<td>Quad 347</td>
<td>Emily McGrath (Rachel Marston, English) The First Date</td>
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<td>10:15 - 10:20 AM</td>
<td>Quad 347</td>
<td>Benjamin M. Gooley (Rachel Marston, English) Windows</td>
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<td>10:20 - 10:25 AM</td>
<td>Quad 347</td>
<td>Marissa Deml (Rachel Marston, English) Later - A Short Story</td>
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<tr>
<td>10:20 - 10:25 AM</td>
<td>Quad 347</td>
<td>Leanne Otto (Rachel Marston, English) &quot;Moonlight Sonata&quot;</td>
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<tr>
<td>10:25 - 10:30 AM</td>
<td>Quad 347</td>
<td>Hannah Haas (Rachel Marston, English) &quot;The Incidents&quot; A Short Story</td>
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<tr>
<td>10:30 - 10:35 AM</td>
<td>Quad 347</td>
<td>Ann Schaenzer (Rachel Marston, English) Goodbyes</td>
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<tr>
<td>10:35 - 10:40 AM</td>
<td>Quad 347</td>
<td>Tierney Chlan (Rachel Marston, English) Bitterness and Tapioca</td>
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<tr>
<td>10:40 - 10:45 AM</td>
<td>Quad 347</td>
<td>Erin Kelso (Rachel Marston, English) Heartcrushed</td>
</tr>
</tbody>
</table>
Abstracts

Heroux: This story is about a bartender and her experiences with different customers.

Koonce: This presentation will consist of a brief reading of an excerpt of my short story, "Paper Trails," a story about first loves and awkward discoveries of sexual identity.

McGrath: A short story told from the point of view of a rather awkward young woman who is going on a date for the first time in, well, years.

Gooley: I will read a portion of my surreal short story titled, "Windows," which is about a man's journey home from the doctor's office after finding out he has cancer. To avoid confronting his wife, he takes a journey through the windows. He experiences increasingly uncomfortable social situations until he finally gives in and returns home.

Demi: This short work of fiction takes place during and after the five minutes spent waiting for the results of a pregnancy test.

Otto: I will be reading a short excerpt from my short story, "Moonlight Sonata." It is about an elderly, invalid woman named Vera witnessing the burglary of her home from her bedroom. As she hear the burglar, she imagines what he is doing in each of the rooms.

Haas: "The Incidents" is a story of the strange occurrences that plague a cabin and defy the laws of nature and physics.
Schaenzer: I will be reading a short excerpt from my short story "Goodbyes." This story is about a man named Carter who is unexpectedly visited by Miranda, a woman he once loved before she left to travel the world to find herself.

Chlan: I will be reading an excerpt from my short story, "Bitterness and Tapioca," which I wrote in my Advanced Creative Writing class. This story begins with the main character, Meredith, getting the call that her grandfather died. Meredith welcomes the news—she never liked the man—but is very reluctant to deal with her past. The only thing about returning to her hometown that Meredith is excited about is getting to see her sister, Iris, whom she hasn’t seen in years. The story follows Meredith and Iris as they sort through their grandfather’s house as well as their relationship as sisters.

Kelso: I will be reading a segment from a short story I wrote for Advanced Creative Writing, in which Meg, a young nurse aid, accidentally lets an elderly resident out of the nursing facility where she works and havoc ensues.

Paal: I will be reading an excerpt from “Devil Winds”, a story I am currently working on. Devil Winds is a story about “Dan,” a young man who grew up in the Suburbs of Chicago, and got a job in Southern California. Because of the fact that Dan was a young accountant, who was just starting out, he wasn’t able to afford a very expensive house. He decided that he would move to West Side Costa Mesa, a Hispanic working class neighborhood; 40 minutes south of Downtown LA. Little did he know, both the living and the spirits of the dead occupied West 19th street. All of his neighbors accepted, and enjoyed sharing their street with the deceased. However, Dan couldn’t accept this idea, and he certainly didn’t enjoy the strange happenings he was witnessing.

Bock: An asthmatic pot pusher is down to the last of his stash, hoping to move the last of it quickly and quietly.

Feichtinger: Andrew, our average college student, gets an assignment from his professor to spend a day with a monk in the monastery. Andrew soon finds out there is a lot that he, and the rest of the students at his school, don’t know about the monastic community. The monks have many comically strange habits that keep Andrew on his toes during his visit, and strangeness ensues.

History

Schedule

9:00 - 9:30 AM
Main TRC  Michael Benson (Gregory Schroeder, History) “The Image of Alienation: Racial Stereotypes of the Romani (“Gypsies”) and Their Effect on Romani Integration in Europe”

9:00 - 9:30 AM  Main TRC  Peter Kyle (Gregory Schroeder, History) “Politics and Protestantism: The Appeal of Reverend Ian Paisley in Northern Ireland”

9:30 - 10:00 AM  Main TRC  Christine Quinones (Gregory Schroeder, History) “A Brief Study of Ideological Indoctrination through Nazi Youth Programs”

9:30 - 10:00 AM  Main TRC  Alex Trebatoski (Gregory Schroeder, History) “Free Speech Movement Identity”

10:15 - 10:45 AM  Main TRC  Sonya Szostkowski (Gregory Schroeder, History) “Evaluating the Advancement of Southern Elite Women’s Roles Regarding the Public and Private Sphere during the American Civil War (1861-1865)”

10:15 - 10:45 AM  Main TRC  Meghan Flannery (Gregory Schroeder, History) “Father of His Country: George Washington’s Creation of His Historical Legacy and its Embellishment in the National Culture of the Early Republic from 1783-1832”

10:45 - 11:15 AM  Main TRC  Yasin Williams (Gregory Schroeder, History) “The Development of the African-American Religious Experience”

10:45 - 11:15 AM  Main TRC  Ian Scudder (Gregory Schroeder, History) “Discord Among the Democrats: Divisions and Differences in the Politics of the Post-Reconstruction South”

Abstracts
**Benson:** The Romani ("Gypsies") have existed in Europe for over a millennium, and throughout that time, other Europeans' relationships with them have been characterized by fear and oppression. This fear is a consequence of the canon of Romani stereotypes that arose in the medieval period and were codified by consensus of Romantic literature throughout Europe—these stereotypes continue into modern times and caused the Romani to be targeted by the Nazi Holocaust, in which one third of the Romani population in Europe was murdered. The Holocaust alerted the world to the problem of anti-Semitism and triggered a global tendency to denounce it. I question whether the Holocaust had the same effect on anti-ziganism (anti-gypsyism): how have the Romani stereotypes changed since the end of World War II? I argue that these stereotypes have not changed on a large scale in any significant way, and that the persistence of these medieval prejudices is a large barrier to tolerance and integration of the Romani in Europe today.

**Kyle:** Many scholars today call Reverend Ian Paisley the voice of Protestant Ulster during the Troubles, due to his outspoken personality and fiery rhetoric. However, his public condemnations of Catholics and refusal to compromise with anyone he opposed also branded him as a highly controversial figure at the time. This project examines Ian Paisley's career as both a politician and a Presbyterian minister in an attempt to better explain how he gained Protestant support when few shared his fundamentalist Christian values. Within the context of the Troubles, Paisley also placed a great emphasis on factors of Protestant identity outside of Christianity. Focusing on ideas like Protestant ethnicity, collective history, and Britishness, within his sermons and speeches, Ian Paisley appealed to a culture already dominated by sectarian tension. This not only won him support, but it also associated him with Ulster Protestantism long after the Troubles ended.

**Quinones:** This thesis serves analyzes the effect Nazi ideological indoctrination had on the development of German children and how these characteristics became apparent in their adulthood. By analyzing primary documents of those who participated in Nazi youth programs, it can be concluded that the experiences of these youths, whether they aligned with or rejected National Socialist ideas, remained ingrained as a part of their development and continue to pervade their expressions after they were no longer involved with the groups. Despite the removal of the National Socialist government in Germany, it succeeded in that its ideas and prejudices survived in the mind of its students.

**Trebatoski:** My presentation will explore the identity of the Free Speech Movement (FSM) protestors at the University of California at Berkeley in the mid 1960's. This movement was in some ways a reflection of its time, in which the students' demands for more freedom from their university and to exercise their rights were
representative of events in the South and events that would occur in the late 60's. I will examine not only the Movement's own idea of identity but also outside views of their identity. I look in depth at a few different media outlets for their views on FSM identity, along with an interesting exploration of Phil Ochs' song "I'm going to say it now," and how it adds to differing perspectives on FSM identity. I then examine the difference between the various groups' ideas of FSM identity to understand some of the differing points of view that swirled around the FSM during its height.

Szostkowski: When the general public thinks about southern women during the Civil War, most usually think they were either southern belles or Confederate nurses. These two roles for women did exist and had different expectations, but they were not the most common for women. Elite women in the South had longstanding expectations of femininity, motherhood, and being good, honorable southern wives, all the while serving to the cause of the Confederacy. Women chose to meet and exceed expectations because it meant they were, at long last, needed for something more than being a subservient wife and mother. Finally recognized for their efforts, they were able to gain progress into the public sphere in terms of religious societies, ladies aid societies, and greater acceptance of public writing. Using newspapers, diaries, and letters, this presentation will detail what causes and aspects attributed to the desire that women held to make their way into the public domain in order to aid the Confederacy.

Flannery: This paper will prove that George Washington carefully crafted his public character as America's first national republican hero with the goal of culturally and politically unifying the early American nation during his service to the United States. With a conscious consideration of his national popularity especially with his victory of the American Revolution, Washington created a public character that represented republican and Enlightenment ideals in order to unite the fragile union of the United States. Washington presented his republican character in his resignation of his command of the Continental Army, his promotion of a new federal government, and his presidency. After his death, Americans embellished the public character that Washington had thoroughly established, making him into a mythic, fatherly icon. As Americans remembered and shared stories of Washington, they accentuated his republican and moral characteristics in their celebrations during Jefferson's presidency, the War of 1812, the Marquis de Lafayette's national tour in 1824-1825, and up to the centennial of Washington's birth in 1832. These memories and celebrations show the rapid development of Washington into the legendary "Father of His Country."

Williams: Although there has been plenty of writing by historians on the tragic events of slavery, there is still much that can be said on the topic. In particular,
historians have yet to draw a clear connection between the secret prayer-meetings or “invisible institutions” of the African slave and the “contemporary black church” of the African-American today. I think the difficulty comes from the century and a half that separates both epochs. However, in my research analysis, I plan to draw a connection between the two churches while also drawing a distinction between the black and white churches. Through this connection of both churches, I will answer two questions: Why did African slaves choose to express agency by refashioning the Christian church? How did they do it? I believe answering these questions is a step closer to unveiling everything there is to know about the history of slavery in America.

**Scudder:** The American South in the decades following the Civil War appeared to be a region unified politically under the Democratic Party. On the surface, this voting unity suggests a central set of beliefs about race and politics that encompasses the entire South. However, the postbellum South was a breeding ground for diverse ideas and agendas even throughout the Democratic Party and its monopoly on Southern politics. So where did the differences lie within the southern Democratic Party, and why did it matter that these differences existed? What was at stake on each side? Speeches, letters, and newspaper editorials from four different major southern political ideologies illuminate the rifts and divides between different members of the southern Democratic Party. Debates about racial issues and how to move forward into a new Southern era pitted apparent allies against one another in a battle to control the character of the South as it transitioned into the 20th century.

**Languages & Cultures**

**Schedule**

- **9:00 - 9:30 AM**
  - HAB 101
  - Melania Meyer (Anna Ohm, Languages & Cultures) The Role of the Sissi Film Trilogy in Developing Austrian Identity after WWII

- **9:30 - 10:00 AM**
  - HAB 101
  - Kathrine Tillman (Mark Thamert, Languages & Cultures) An Examination of Motives for Joining the European Union: A Case Study of Austria

- **10:00 - 10:30 AM**
  - HAB 107
  - Elizabeth Ringle (Camilla Krone, Languages & Cultures) Moliere - Feminist or Misogynist?
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<td>10:00 - 10:30 AM</td>
<td>HAB 101</td>
<td>Rebecca R. Bilbro (Andreas Kiryakakis, Languages &amp; Cultures) Teaching the Grimm Fairy Tales</td>
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<td>10:30 - 11:00 AM</td>
<td>HAB 107</td>
<td>Samantha Cox (Camilla Krone, Languages &amp; Cultures) A Comparison of Francophone Communities in North America</td>
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<td>10:30 - 10:40 AM</td>
<td>HAB 121</td>
<td>Stephen G. Dornbach (Masami Limpert, Languages &amp; Cultures) Fun Times in Fuchu, Japan!</td>
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<td>10:30 - 11:00 AM</td>
<td>HAB 101</td>
<td>Donovan P. Sullivan (Anna Ohm, Languages &amp; Cultures) The failure of the resistance to the Third Reich as reflected in the films &quot;Valkyrie&quot; and &quot;Sophie Scholl: die letzten Tage&quot;</td>
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<td>10:40 - 10:50 AM</td>
<td>HAB 121</td>
<td>Nicholas Burke (Masami Limpert, Languages &amp; Cultures) The Japanese City of Chiba</td>
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<td>Adam J. Hey (Masami Limpert, Languages &amp; Cultures) Saitama City, Japan</td>
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<td>11:00 - 11:30 AM</td>
<td>HAB 101</td>
<td>Addison J. Novak (Anna Ohm, Languages &amp; Cultures) The “New Morbidity”: The Fight against the Stigmatization of Mental Illnesses among Young Adults in Germany through Public Awareness Campaigns</td>
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<td>Qingying Zhu (Masami Limpert, Languages &amp; Cultures) Okinawa Japan</td>
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<td>11:00 - 11:30 AM</td>
<td>HAB 107</td>
<td>Lauren Hayes (Camilla Krone, Languages &amp; Cultures) Les Malentendus et Les Stéréotypes</td>
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Meyer: Empress Elisabeth, more popularly known as Sissi, was a member of the Habsburg court from 1854, the year of her marriage to the Emperor Franz Josef I, to 1898, the year of her assassination. Not until 1955, however, did an Austrian film company release a trilogy of films about her life. The timing of the film’s release, ten years after the end of World War II and in the year of Austria’s independence, gives us insight into the filmmakers’ intent for creating the films at the time that they did, and the role the films played in helping to form an Austrian identity. Secondary themes in the Sissi trilogy are the military, gender roles and other aspects of Austrian culture. Today, over fifty years after the release of the films, Sissi’s popularity continues with Sissi-themed souvenirs being sold at Schönbrunn Palace and other gift shops in Vienna, as well as continued popularity of the Sissi films throughout Germany and Austria.

Tillman: Austria joined the European Union in 1995 shortly following the implementation of the Maastricht Treaty, which altered the design of the European Union and required a greater sacrifice of sovereignty by the incoming members. After a brief discussion of the historical development of the European Union from its foundation through the 1990s, I will move on to an analysis of statements from political leaders of the time to determine the most important factor that led Austrians to eventually vote yes on the membership referendum.

Ringle: A study of 17th century French playwright Molière’s plays through the lens of feminism, focusing on two of his plays: L’Ecole des femmes and Les Femmes savantes. These two plays brought about a lot of discussion during their time and since about the questions how much control should a woman have over her own life and the lives of others, and whether a woman should be educated; if so how much? I will discuss whether Molière’s plays could be considered feminist for the time they were performed, using the reactions the plays have gathered since their debut as well as the plays themselves as a basis for my conclusion.

Bilbro: For my senior project, I have created a unit plan to teach the Grimm Brothers’ fairy tales to third year German students in high school. I have researched ways to teach fairy tales, what the elements of a fairy tale are, and the biographies of
the Grimm Brothers. I will use fairy tales to teach the present perfect and simple past tenses as well as culture. Fairy tales are a good way to help students build vocabulary and grammar skills in a fun and interesting way, and fairy tales can help explain the way of life for people a long time ago.

**Cox:** This research project is a review of the factors that unify and distinguish the various French speaking communities of North America. Although surely there are French speakers outside of these communities, this research focuses mainly on the following regions: Québec, Acadia, Western Canada, Louisiana, and New England. I aim to explore any tensions that may exist between these communities, the circumstances in which they cooperate towards a common goal as well as those in which they prefer to act as smaller, separate groups. Is a common spoken language the only thing that unifies these various cultural groups? Is this common language even a unifying characteristic at all?

**Dornbach:** Hear yee hear yee!! This project will talk about all of the fun things to do in a wonderful sub-section of Tokyo, called Fuchu. This will be an in depth exploration into the life of a modern day Fuchu resident. Prepare to be amazed! This is a presentation you won't want to miss!!

**Sullivan:** My thesis determines common denominators as to why German resistances groups were not successful in opposing Hitler’s regime. In particular, I examine the films “Valkyrie,” the story of the military operation to assassinate Hitler and install a new government, and “Sophie Scholl: Die letzten Tage,” which focuses on the last days of a student resistance group in Munich, The White Rose, created for the purpose of making and distributing anti-Nazi fliers. I analyze particular scenes from these films that depict the weaknesses of the “Widerstand” and make comparisons and contrasts between them. Some of my conclusions include: the unwillingness to participate in the German resistance because of fear and obedience, the overall attitude of the German people to let the politicians be their conscience, and the consequences tied to being a traitor.

**Burke:** This presentation done in the Japanese language will focus on the Japanese city of Chiba and the numerous individuals who reside there. The presenter will explore areas of cultural heritage, history, landmark locations and pop culture that permeate the city. This presentation should offer an insightful and informative look into life in Japan as a whole as well as exploring one of Kanto’s primary seaports.

**Hey:** An oral presentation on the city of Saitama and the surrounding area in Japanese.
Novak: For much of its history, mental illness has been looked upon with fear, even
disgust, shaming those who have to bear its burden. Current research has shown
that such stigmatization causes sufferers to avoid seeking the help they desperately
need. Surprisingly, German citizens are particularly skeptical of the effectiveness of
psychological counseling and psychiatry. As a result, less than half the individuals
needing treatment receive help. Moreover, suicide is the second leading cause of
death among young adults, and the majority of those committing or attempting
suicide have a diagnosable mental disorder. The consequences arising from the
stigmatization of mental disorders in Germany are explored, as well as solutions,
which may lie in media portrayal as well as in governmental action through public
awareness campaigns.

Zhu: This is a presentation about the beautiful culture and history about Okinawa
in Japanese.

Hayes: In this paper I compare the cultures of European enterprises, particularly
those in Belgium, and Japanese corporate culture. This analysis of international
corporate culture is done through a comparative study of a variety of experiences of
Japanese employees versus those of European employees. I also make use of the
autobiographical novel by Amélie Nothomb, Stupeur et Tremblements, Hofstede’s
cultural dimensions and a comparison of Japanese and European feelings towards
work and life balance. I conclude my research with a look at the importance of
understanding culture in business as well as the role that educating business men
and women on intercultural communication can play in business success in an
international environment.

Sato: I will be presenting on modern day Japanese beauty standards and some
history on it as well.

Yokanan: One of the most fascinating aspect of the Japanese culture is its tea. Not
only tea is a beverage that everyone in Japan drinks, but there is also tea ceremony, a
formal output in the world of art. While I was studying abroad in Japan I was able
to experience tea ceremony, and through the exchange, the tea ceremony taught me
a lot of things about the spirit of the Japanese. Presentation will be in Japanese.
**Natural Sciences Presentations:**

**Chemistry**

**Schedule**

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<td>ASC 127</td>
<td>Joseph S. Pollei</td>
<td>Copper-Nitrogen Interactions of a Ceruloplasmin Model Enzyme</td>
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<td>9:00 - 9:30 AM</td>
<td>ASC 105</td>
<td>Joshua Lorenz</td>
<td>Investigation of Aromatic Amine Inhibitors of LMW-PTP</td>
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<td>Katherine Maguire</td>
<td>Asymmetric Aldol Reaction Induced by Chiral Auxiliary</td>
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<td>Gabriel Amon</td>
<td>Quantification of Epoxides from their Carbamate Derivatives: Environmental Applications</td>
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<td>9:00 - 9:30 AM</td>
<td>ASC 104</td>
<td>Ingrid Grandgenett</td>
<td>The Effects of Soil Composition on Water Retention Rates</td>
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<td>9:30 - 10:00 AM</td>
<td>ASC 104</td>
<td>Jeffrey L. Bowers</td>
<td>Probing the Interactions of Polyethylene Glycol-Coated Magnetic Nanoparticles with Human Hemoglobin</td>
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<td>9:30 - 10:00 AM</td>
<td>ASC 127</td>
<td>Levi Salzl</td>
<td>Dihydrocarvone-Based Polyurethanes</td>
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<td>9:30 - 10:00 AM</td>
<td>ASC 121</td>
<td>Timothy J. Doyle</td>
<td>Redox Potential of Metal Complexes: Development of a Laboratory Project</td>
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**ASC 107**
Emmanuel G. Freeman (Kate Graham, Chemistry) Pure Epoxides

9:30 - 10:00 AM

ASC 105
Benjamin T. Kor (Edward McIntee, Chemistry) Making, Modeling, and Biological Testing of Potential Anticancer Agents

10:00 - 10:30 AM

ASC 127
Carmen Probst (Chris Schaller, Chemistry) Biodegradable Polymers and their Biomedical Applications

10:00 - 10:30 AM

ASC 105
Mara Janning (Alicia Peterson, Edward McIntee, Chemistry) Screening of Inhibitors against Purine Nucleoside Phosphorylase

10:00 - 10:30 AM

ASC 107
Brianne Gibson (Kate Graham, Chemistry) Synthesis of 1,2-Amino Alcohols through Arbuzov Approach

10:00 - 10:30 AM

ASC 104
Thomas D. Steichen (Md Fazal, Chemistry) Paper-Based Device for Colorimetric Detection of Malondialdehyde in Biological Samples

10:00 - 10:30 AM

ASC 121
Cameron Axberg (Christen Strollo Gordon, Chemistry) Characterization of Aqueous Phase Atmospheric Reactions

10:30 - 11:00 AM

ASC 121
Ian C. Manion (Christen Strollo Gordon, Chemistry) Carbon Sequestration, what’s that?

10:30 - 11:00 AM

ASC 127
Clare Johnston (Chris Schaller, Chemistry) Synthesis of sustainable monomers for a polyurethane

10:30 - 11:00 AM

ASC 104
Alexander Bramer (Annette Raigoza, Chemistry) Characterization of Self-Assembled Monolayers
Composed of Various Alkyl Thiols Using Scanning Tunneling Microscopy

10:30 - 11:00 AM
ASC 105
Mai Chee Vang (Rachel Hutcheson, Chemistry)
Investigation of Alcohol Metabolizing Enzymes

10:30 - 11:00 AM
ASC 107
Jack A. Luke (Thomas Jones, Chemistry) An Investigative Look into the Sesquiterpenes Displaying the Rare Pacifigorgiane Carbon Skeleton

11:00 - 11:30 AM
ASC 121
William McCue (Christen Strollo Gordon, Chemistry)
Transformation of atmospheric epoxides into their carbamate derivatives and their effect on climate change

11:00 - 11:30 AM
ASC 127
Anna M. Luke (Alicia Peterson, Chemistry) Rhodium Catalyzed Hydrodehalogenation of Fluoroarenes in Mild Conditions

11:00 - 11:30 AM
ASC 104
Joseph Cartier (Annette Raigoza, Chemistry) The Formation of Self Assembled Monolayers using Hexyl Isothiocyanate

11:00 - 11:30 AM
ASC 105
Christian Wilmore (Rachel Hutcheson, Chemistry) Investigations into Uncharacterized Radical S-Adenosylmethionine (SAM) Enzymes

11:00 - 11:30 AM
ASC 107
Marie F. Nilles-Melchert (Henry Jakubowski, Chemistry)
Treating Tuberculosis: Examining Shorter Regimens

Abstracts

Pollee: Multicopper oxidases are of great interest due to their ability to catalyze the reduction of O₂ to H₂O. An example of such a compound is ceruloplasmin, which contains three copper ions incorporated into its structure. The function of ceruloplasmin is not well understood, and part of the difficulty in studying such an
enzyme is its size. To better understand the function of a multicopper oxidase such as ceruloplasmin, model enzymes can be utilized, which allow us to focus only on the active components of the enzyme. The synthesis of one arm of such a model enzyme was undertaken, in order to better understand how the copper ions are incorporated into the active site of ceruloplasmin. At this point, the model arm has been synthesized, but is not purified to the point that accurate results can be obtained from the incorporation of copper ions into the structure. When the model arm is sufficiently purified, the copper ions can be introduced, and 1H NMR can be utilized in order to understand which nitrogen atoms interact with the copper ions. Procedures from the literature were followed and improved upon in the project. Future work on the project will include fully characterizing and purifying the model complex so that the copper ions can be added and more accurate results can be obtained.

Lorenz: The goal of this investigation is to generate a combinatorial library of novel aromatic amino based inhibitors to LMW-PTP via in silico screening, synthesis of those displaying the lowest docking scores, and finally, to test their levels of inhibition in vitro. Using Maestro, Schrödinger’s robust modeling program, 161 aromatic amino compounds were bound to the core molecule. Subsequently, human isoform 1XWW of LMW-PTP was exposed to the novel compounds via the Glide feature within Maestro and their docking scores were recorded. However, due to the double bond nature of the azo compounds (and the lack of Glide’s compatibility with preparing a library of ligands across a double bond), many of the proposed ligands’ docking scores were not calculated via Glide, but simply by building the ligand and exposing it to 1XWW individually. Four promising leads expressing the lowest docking scores from the trial were selected for synthesis. The synthesis of the inhibitors was achieved through Sandmeyer reactions and purification was performed via recrystallization. Inhibition assays were conducted according to the procedure outlined by DeSouza, Louwagie, and Seiler. The results of the inhibitory assays will be compiled into a grid containing the structure and docking score of each novel inhibitor. The overactivity of LMW-PTPases has been associated with the development of cancer and diabetes. Therefore, the importance of identifying potent inhibitors of LMW-PTP cannot be understated, as they may one day serve as effective treatments to these diseases.

Maguire: The principal objective is to allow undergraduate students to examine asymmetric reactions in three steps: synthesis of the chiral auxiliary, attachment of the chiral auxiliary to the aldol substrate, and the aldol reaction via in situ formation of the corresponding boron enolate. The purchased chiral auxiliary, (S)-4-Benzyl-2-Oxazolidinone, was successfully attached to the aldol substrate and the aldol reaction completed. 1H and 13C NMRs were used for structural analysis. The
experiment is very feasible for an undergraduate laboratory as each steps takes approximately 3-4 hours each.

**Amon:** This project focuses on developing a method to quantify epoxides in atmospheric organic aerosol samples. In the atmosphere, there are copious environmental contaminants present that can affect people’s health as well as climate and one particular class of compounds of growing interest are epoxides. Epoxides are formed in the atmosphere through oxidations of volatile organic compounds, but there is little information on their ambient concentrations due to their high reactivity. Previous research has been done to quantify epoxides in biological and water samples, but there are few methods to quantify in atmospheric aerosol samples. Various model epoxide compounds are derivatized with sodium diethylcarbamidithioate (DTC) and the concentration of the resulting carbamate is measured at 278 nm. Calibration curves for 6 model epoxides have been measured with a linear dynamic range of 2.5–50 μM. An HPLC method has also been developed to separate derivatized epoxides from the aerosol mixture for identification using electrospray mass spectrometry. Finally, these methods are used to quantify epoxides formed from the reaction of m-xylene with hydroxyl radicals in an environmental chamber. These methods allow for quantification, identification, and structure elucidation of epoxide compounds in organic atmospheric aerosol.

**Grandgenett:** The increasing demands for usable water for the population creates a need for more efficient practices utilizing clean water resources. Irrigation for farmland uses a significant portion of potable water that has been declining in recent years. The changing amount of rainfall and surface water that is accessible for use in farming has created an issue regarding the use of underground water as irrigation instead of drinking water. The soil texture and structure greatly influence the water filtration, permeability, and water-holding capacity of the soil. These properties influence the efficiency of water retention for irrigated and dry-land crop production systems and the estimated efficiency is 50%. There have been attempts to increase the efficiency of the water retention in soils in order to reduce the amount of potable water used for irrigation. The attempts to increase the efficiency have used several different methods for modeling the existing water retention rates. The goal of these experiments is to improve the water retention properties of the soil in order to preserve the supply of potable water.

**Bowers:** The interactions between polyethylene glycol (PEG)-coated magnetic nanoparticles (MNPs) and human hemoglobin (Hb) were investigated using various spectroscopic techniques. UV-Vis spectrophotometry and dynamic light scattering (DLS) indicated strong binding between Hb and MNPs. Fluorescence quenching experiments were used to determine the binding constant (Kₐ), enthalpy changes (ΔH₀), entropy changes (ΔS₀), and free energy changes (ΔG₀). Results indicated that
PEG-coated nanoparticles quenched hemoglobin fluorescence mainly by a static quenching mechanism. The binding constants (Ka) were determined as $1.12 \pm 0.18 \times 10^7$ M$^{-1}$, $0.95 \pm 0.12 \times 10^7$ M$^{-1}$, and $0.78 \pm 0.16 \times 10^7$ M$^{-1}$ at 297, 302, and 307 K, respectively. The changes of secondary structure of hemoglobin due to binding with nanoparticles will also be investigated in the future using circular dichroism (CD) spectroscopy.

**Salzl:** In order to continue exploring the field of renewable polyurethanes, monomer and polymer syntheses were explored using the bio-renewable feedstocks, dihydrocarvone and menthone. Polymer synthesis can be derived from lactone polymerization, but a green synthetic approach to lactones from these sources required a Bayer-Villager reaction catalyzed by Oxone$^*$. Addition of catalytic Dess-Martin period inane resulted in a promising increase in yield of this reaction, producing dihydrocarvide. Co-polymerization took place with benzyl alcohol or 1,4-butanediol as initiator and diethylzinc as catalyst. NMR studies of the co-polymer showed a good degree of control over the product using menthide/dihydrocarvide ratios of 3:15, 4:14, 5:13, and 6:12. Post-polymerization modification of the co-polymer to make polyamines was attempted through a thiol-ene addition of cysteamine hydrochloride to pendant alkenes.

**Doyle:** The goal of this project is to investigate the binding of various cobalt metal complexes with DNA using cyclic voltammetry (CV). The water-soluble metal complex, tris (1, 10-phenanthroline) cobalt (III) was first synthesized prior to characterization. Initial trials showed no binding of the metal complexes with DNA. This is due to the high concentration of proteins present in the DNA solution. Further trials investigated the binding of the metal complexes with bovine serum albumin (BSA). The BSA trials also showed no binding of the metal complex with the DNA. Binding with another strain of DNA and purified DNA will be discussed. The project will be used in integrated laboratory and would give students experience using a CV, synthesizing a metal complex, and investigating binding mechanisms.

**Freeman:** In an attempt to prepare phosphonate sugars, our research group has struggled to purify the phosphonate epoxide product in (scheme 1). An alternate approach to synthesizing and purifying this compound was developed (Scheme 2). An Arbuzov reaction was used to make the diethyl cinnamoylphosphonate. The reaction was then followed by silica gel chromatography. NMR and the IR spectroscopy were used to determine the product structure. Progress is being made to complete the second scheme. Once completed, we will evaluate the effectiveness of the two approaches by calculating the percent recovery and purity.
Kor: The objective is to synthesize an inhibitor of Low Molecular Weight Protein Tyrosine Phosphatase (LMW-PTP) that is unable to degraded as quickly as a current known inhibitor, Pyridoxal 5'- Phosphate (PLP). LMW-PTP is a target to investigate due to it being found in high concentrations in malignant cells. Inhibition of LMW-PTP may be one way in order to treat cancer. Boronic acids are a suitable mimic for the hydrolyzable phosphate group of PLP. To make these boronic acids, we did a hydroboration of an alkene. The chemistry was developed using benzaldehyde and styrene as the model aldehyde and alkene. We started with benzaldehyde and converted it to styrene using the Wittig reaction described in Keliher. The styrene was then converted to the boronic acid using dichloroborane-dioxane and water as described in Josyula. The boronic acid analog of PLP has not yet been synthesized. Once synthesized, its inhibitory effects on LMW-PTP will be investigated.

Probst: This project outlines the history of the field of biodegradable polymers. It focuses on the synthetic approaches to the polymers as well as their degradation mechanisms. The application of these materials within the biomedical field is also addressed.

Janning: Purine nucleoside phosphorylase (PNP) catalyzes a reversible reaction of inosine and hypoxanthine, is involved in the salvage pathway of purine metabolism, and is essential for the proliferation of T- and B-cells. Finding a suitable inhibitor for PNP is important for treating T- and B-cell problems. First, a coupled enzymatic assay was run modified from the literature. Then several candidates were screened and monitored using UV similar to the literature. These new inhibitors were screened using a 96 well plate, scaling down the process from using cuvettes and requiring less material per test. Each candidate was tested at various dilutions to determine the EC50 and IC50 values. These tests were done to develop an integrated lab experience. So far, eleven candidates have been tested for their ability to bind and inhibit PNP. A good inhibitor binds to PNP, inactivating it. These inhibitors can be used to therapeutically treat T- and B-cell malignancies, gout, psoriasis, rheumatoid arthritis, and malaria.


Gibson: This research involves the synthesis of one diethyl amino-dihydroxy butyl phosphonate which hold characteristics shown to serve as an anti-fungal and antimicrobial agent. The first step of this research involves epoxidation of the phosphonate-containing olefin made using the Arbuzov procedure with crotonaldehyde. The second step synthesizes an oxazolidone using benzyl isocyanate to open the epoxide and cyclize the compound. Hydrolysis of the oxazolidone is performed for the production of the 1, 2 amino-alcohols in the third stage. This step synthesizes the amino-phosphonates. The preparation for the first step, as well as the first step itself has been completed. Upon successful retrieval of the oxazolidones, the alcohol can be synthesized. The oxazolidone will also be manipulated to produce phosphonosugars. Throughout the exploration of these compounds, stereo-chemical manipulation on the epoxides and their resulting products will also be investigated.

Steichen: Oxidative stress in biological systems is known to be involved in the development of many diseases such as Alzheimer’s disease, Parkinson’s disease, many cancers, among numerous other disorders and diseases in patients. Oxidative stress in a biological sample is caused by the accumulation of Reactive Oxygen Species, which results in the formation of free radicals and peroxides which can damage and/or have adverse effects on cell function. Our research primarily involves the oxidative stress biomarker Malondialdehyde (MDA), one of the major products of lipid peroxidation in a cell. The goal of our research is to develop a paper-based microfluidic device that is able to colorimetrically determine levels of MDA in a biological sample, specifically in saliva. This measurable change in color is done through the formation of a complex of MDA and Thiobarbituric acid (TBA) which absorbs light at 532nm, appearing pink. Our research has optimized this technology by adjusting variables in the preparation of the paper and addition of biological samples to achieve an optimum LOD as well as accurate and precise measurements of the analyte. This will provide a portable and affordable way to easily and accurately determine one’s level of oxidative stress without the use of invasive or expensive equipment.

Axberg: This project focuses on simulating aqueous phase atmospheric reactions of small molecules with hydroxyl radicals to form high molecular weight products. Aqueous phase atmospheric chemistry is becoming an increasing area of research to
try and identify the products forming in our atmosphere and assess their impact. Hydroxyl radicals are a major oxidant in the atmosphere for the formation of a variety of compounds and it is believed that many of these compounds lead to secondary formation of aerosols. Based on previous research glyoxal, acetic acid, and m-xylene are believed to be important for the formation of these oligomers and other products that lead to these organic aerosols. This research focuses on characterizing these oligomers and intermediate products in an effort to better understand the pathway for the formation of organic aerosols. The solubility of these high molecular weight products will be explored.

**Manion:** The Earth’s climate is currently experiencing a rapid increase in the mean global temperature of a degree higher than any previously observed natural change of temperature in Earth’s history. It has been shown that rising levels of atmospheric CO2 could lead to temperatures rising beyond what would be a manageable level for living organisms. Carbon sequestration science offers a variety of methods for decreasing atmospheric CO2 concentrations through direct removal as well as emission reduction from industrial sources. Carbon sequestration is an essential part of society’s current move toward sustainability and this talk will focus on the different strategies for reducing atmospheric CO2 concentrations.

**Johnston:** The aim of this project was to develop a renewable polyurethane from a dihydrocarvide- and menthide-based polyamine. Synthesis of dihydrocarvide presented difficulties due to unwanted side products. Previously published procedures for the Baeyer-Villiger oxidation of dihydrocarvone to dihydrocarvide produced a mixture: 60% desired lactone and 40% epoxide. Optimal synthesis of dihydrocarvide was studied through the addition of various salts, Lewis acids, and oxidants. Superior results were ultimately obtained through the use of catalytic amounts of oxidants including sodium molybdate, potassium permanganate, and Dess-Martin periodinane. These conditions led to lactone in 96-98% purity by 1H NMR and an isolated yield of 85%. Subsequent copolymerization of menthide and dihydrocarvide was successful with good control of polymer molar masses determined from 1H NMR spectra. Polyamine synthesis studies are ongoing.

**Bramer:** Self-assembled monolayers are the most elemental form of an organic thin film material at the nanometer scale, and form structured patterns on the gold surface so by changing the thiols arranged on the surface of gold the interfacial properties of the metal can be modified. Characterization of these respective thiols on gold thus provides information on how each of them modifies the surface differently. This research sought to characterize and compare the surface organization of alkyl thiols with differing groups attached to the sulfur head. Monolayers of octanethiol, 2-ethylhexanethiol, and cyclohexanethiol were deposited onto gold samples using solution deposition. Scanning tunneling microscopy
STM was used to characterize the surface structure of the formed monolayers. Matlab was then used to process the STM surface images.

**Vang:** Pharmacogenomics is concerned with the study of how groups of people differ in their responses to drugs due to their genetics, and its future is focused on optimizing individualized treatments for patients. One drug that causes 3.3 million deaths worldwide that differs in metabolism between racial populations and gender is alcohol consumption. The two enzymes responsible for ethanol metabolism are liver alcohol dehydrogenase (ADH) and aldehyde dehydrogenase (ALDH). The main steps that remove ethanol from the body are ADH oxidizing ethanol to acetaldehyde and then ALDH oxidizes acetaldehyde into acetic acid. The acetic acid can then be excreted in urine or be reused by conversion into acetyl-coenzyme A. Due to the different isoforms of ADH and ALDH, certain alleles such as the ALDH2*2 and ADH2*3 cause certain ethnicities to react differently when consuming alcohol. Not only do different isoforms of alleles matter but one’s gender also plays a role in how alcohol can be metabolized in the body. Within certain individuals, alcoholism tends to occur at a higher rate than others. This is due to the different isoforms of ADH and ALDH that a person has in their DNA. Disulfiram is an effective treatment for alcoholism because it is able to inhibit acetaldehyde from being used as a substrate by dehydrogenase, aldolases, and oxidases. Acamprosate in a new drug that has been proved useful in treatment of alcohol dependence as well; however, the exact mechanism is still unknown. Future research in ethanol metabolism and alcoholism treatment includes investigation into Acamprosate’s mechanism of action as well as exploration of ethanol metabolism in interracial individuals. The results of these studies would be beneficial to the emerging field of pharmacogenomics and the treatment of alcoholism in people with different genetic backgrounds.

**Luke:** Abstract – A number of natural products have been isolated from gorgonian soft corals found throughout the world’s oceans. These natural products, which show significant biological activity, have been synthetic targets for the past few decades. Pacifigorgiol displays ichthyotoxic properties at very low concentrations while Tamariscol is noted as having a pleasant fragrance to be used as a perfume. This presentation will discuss the synthetic efforts toward these sesquiterpenes, which display the rare pacifigorgiane carbon skeleton.

**McCue:** Abstract. The goal of the following paper is the quantification and qualification of epoxides derivatives to study their effect on atmospheric climate change. Epoxides were derived through the use of diethyldithiocarbamate in a hot bath at constant pressure. Samples were analyzed using high-performance liquid chromatography and ultraviolet/visible spectroscopy. Peak area and absorbance values were plotted against concentration to determine a linear relationship between the two variables. This research is novel in that it aimed to create one unique
methodology which could be used for the analysis of any unknown epoxide mixture. Through the research, we were able to formulate an effective method for the six tested epoxide compounds. Future research will involve taking unknown air samples and determining the epoxides and quantities of the epoxides in the sample. This research is beneficial to the study of environmental chemistry because the quantification and qualification of epoxides within the atmosphere will allow for proper methods to be derived to combat the epoxides in the air.

Luke: The fate of fluoroarenes in the environment has become a concern, in part because of the higher use of fluoroarenes in pharmaceuticals and industrial processes. One way to help alleviate this environmental concern is to explore ways in which fluoroarenes are degraded to benign compounds. Fluorinated aromatic compounds are hydrodefluorinated using a heterogeneous 5 wt % rhodium on alumina catalyst under mild conditions (1 atm. H2, 25°C). The catalytic hydrodehalogenation mechanism and substrate scope were explored by looking at a variety of substituted fluoroarenes. The effects of electron-withdrawing and electron-donating substituents as well as the position of the substituents to the fluorine atom (ortho, meta, para) were examined. The substrate degradation, subsequent intermediate(s), and product formation rates were monitored using GC/MS. The fluorophenols are the quickest to undergo degradation with an average rate of $5.0 + 1.1 \times 10^{-3}$ min$^{-1}$mg$^{-1}$ Rh/Al2O3 and the fluoronitrobenzenes, with an average degradation rate constant of $0.80 + 0.40 \times 10^{-3}$ min$^{-1}$mg$^{-1}$ Rh/Al2O3, are the slowest.

Cartier: Self-assembled monolayers (SAMs) are made by depositing compounds on a surface, which can give scientists greater control over the properties of that surface. Through this procedure, the surface can be made hydrophilic or hydrophobic. This research has focused on understanding molecule interactions with the substrate, specifically looking at the deposition of hexyl-isothiocyanate on Au(111) and comparing it to the well-studied surface made by depositing octanethiol on Au(111). Samples were prepared through a solution-based deposition and analyzed using scanning tunneling microscopy (STM). It was discovered that the hexyl-isothiocyanate formed structured domains on the surface along with areas with limited to no structure. The results obtained open the door for further investigation into the ability of all isothiocyanates as potential substrates for the creation of SAMs.

Wilmore: Radical S-Adenosylmethionine (SAM) enzymes are a superfamily of thousands of enzymes from all kingdoms of life whose varied functions include enzyme activation, vitamin biosynthesis, DNA repair and antibiotic resistance among many others. These enzymes share a conserved cysteine motif which binds an iron sulfur cluster that plays an essential role in the reductive cleavage of SAM
producing methionine and a 5′ - deoxyadenosyl (dAdo) radical. This radical is responsible for the initiation of further steps in radical SAM enzyme catalysis. While there are a handful of well characterized radical SAM enzymes, there are still hypothesized subgroups of these enzymes which remain unstudied. Additional investigation of these enzymes will allow for a better understanding of how these common characteristics allow for such a diverse set of catalyzed reactions. To advance our understanding of these enzymes and their catalytic mechanisms two genes encoding for hypothetical radical SAM enzymes were selected for analysis. The Structure Function Linkage Database maintained by the University of California, San Francisco (UCSF) was used to screen subgroups of the Radical SAM superfamily for potential but unstudied enzymes. One of the selected gene products is being cloned into an expression vector by Blue Heron and the second is being cloned into a pET-14b expression vector utilizing PCR, restriction enzyme digests, and ligation reactions. Gene insertion will be verified with DNA sequencing. Once these vectors containing the gene inserts are obtained, the gene product will be over-expressed and purified using a Ni-affinity column and the Fe-S cluster reconstituted. This resulting enzyme can then be used for further experiments.

Nilles-Melchert: Mycobacterium tuberculosis, the bacteria that causes tuberculosis (TB) has been a global public health concern for decades. An estimated one-third of the population carrying latent tuberculosis and millions of cases of active TB are diagnosed every year. There exists a treatment regimen that, until recently, could effectively treat TB. Tuberculosis is such an old disease and since effective treatment options exists, why is it still such a prevalent disease? Why is this regimen no longer effective? The treatment regimen is long and therefore patient compliance is difficult to maintain for the entire duration of treatment; this has led to severe drug resistance, further complicating the fight against TB. Recent TB research has focused on shortening the treatment regimen to help increase patient compliance and eliminate the creation of new drug-resistant strains of TB. This review examines some of these new shorter treatment options.

Mathematics

Schedule

10:00 - 10:20 AM
PEngl 248
Esther M. Banaian (Thomas Sibley, Mathematics)
Probability of Generating a group with two elements

10:20 - 10:40 AM
PEngl 248
Zachary Bookey (Thomas Sibley, Mathematics)
How Many Roots can we have?
10:40 - 11:00 AM
PEnl 248  Bryan Linehan (Thomas Sibley, Mathematics) Sysilic
Groups

11:00 - 11:30 AM
PEnl 248  Melania Meyer (Robert Hesse, Mathematics) Modeling a
Three-Species Predator-Prey Ecosystem

Abstracts

Banaian: This project focused on groups that are generated by two elements and
found the probability that two random elements will still generate the whole group.
This extended previous work on symmetric, dihedral, and some Abelian groups.
Specifically, we examined probabilities for dicyclic groups and semi-direct products.

Bookey: Polynomials of the form $x^2 + a \cdot x + b$ over the field of Complex numbers
have the property that they have two roots. If we inspect rings instead of fields we
find that some polynomials of that form have more than two roots. Specifically we
take a look at polynomials of the form $x^2 + ax + b$ in the ring $\mathbb{Z}_n$ and which values
of $a$, $b$, and $n$ cause these polynomials to have multiple roots, and with those results
we attempt to generalize to other rings that are not integral domains.

Linehan: A Sysilic group is a group, $G$, such that $G$ contains a set of cyclic
subgroups, $S$, that together span all the elements of $G$,
and if $\langle x \rangle$ and $\langle y \rangle$ are distinct elements of $S$, then $\langle x \rangle \cap \langle y \rangle = \{e\}$. This presentation
explores the structure of these groups.

Meyer: In a model of an ecosystem, a differential equation is used to model the
growth and death rates of each species, creating a system of differential equations
describing an ecosystem, with one equation per species. Modeling an ecosystem
with differential equations is particularly helpful when examining the long-term
behaviors of the populations. Not only do equilibria tell a lot about populations in
an ecosystem over a period of time, but the differential equations can also be used to
find the eigenvalues of these equilibria, which describe the behavior of the
populations around these specific values. In this work, we looked at a basic three-
species predator-prey Lotka-Volterra model and its behavior around equilibria
points. Next, we examined an interesting behavior of the Lotka-Volterra model
along with two variations of the three-species Lotka-Volterra model and a version of
the Arditi-Ginzburg model, which is a ratio-dependent predator-prey model. We
compared the behaviors of these models by examining the differences in equilibria
points as well as differences in long-term behavior around these equilibria.
### Nursing

#### Schedule

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<th>Time</th>
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<td>10:00 - 10:40 AM</td>
<td>HAB 128 A</td>
<td>Hannah Jacobs, Jennifer Schmitz, Alexandra Mareck, Kailee Draz (Gary Gillitzer, Nursing) Improving Standards of Care in a Long-Term Care Facility</td>
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<tr>
<td>10:00 - 10:40 AM</td>
<td>BACA 108</td>
<td>Kathryn J. Smith, Rachel Pollard (Rachelle Larsen, Luann Reif, Nursing) New Graduate RNs in Public Health</td>
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<td>10:00 - 10:40 AM</td>
<td>BACA 107</td>
<td>Heidi Rajkowski, Chelsea Holst (Julie Strelov, Nursing) Independent Dementia-associated Behavior Interventions Approach</td>
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<td>11:00 - 11:40 AM</td>
<td>BACA 106</td>
<td>Thomas Zasmeta, Kylee Hoheisel, Emily Gnahn, Katy Smith, Claire O’Brien, Melissa Kahl (Carrie Hoover, Nursing) Reducing Antipsychotic Medication Use in the Elderly</td>
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<td>11:00 - 11:40 AM</td>
<td>HAB 128 B</td>
<td>Jenna O’Donnell, Ashley Shipp, Taylor Reiner (Julie Strelov, Nursing) Pain management in post-surgical patients at a skilled nursing facility</td>
</tr>
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#### Abstracts

**Jacobs, Schmitz, Mareck, Draz:** A local long-term care facility requested senior nursing students complete mock audits to help the facility prepare for Minnesota Department of Health visits. Two mock audits were completed focusing on five main categories identified by the Director of Nursing. These categories included dignity and privacy, safety, infection control, teamwork, and therapeutic recreation. Data was collected from eight households through observation of the unit environment and staff on both day and evening shift. After analyzing the data collected, one area of improvement was identified in each category and evidence-based resources were identified to support quality improvement in these areas. The interventions were shared with the nursing staff at an interdisciplinary meeting and
follow up assessment was completed two weeks post implementation to determine compliance with the suggested interventions.

**Smith, Pollard:** The current nursing shortage has impacted all areas of nursing, including public health. As our healthcare system continues to shift toward a prevention-based model, the need for trained public health nurses will continue to increase. Several solutions have been suggested to improve recruitment and retention of public health nurses; this project focused on the intervention of hiring new graduates to meet the demand for qualified public health nurses. One of the barriers keeping new graduate RNs from public health is the two-year experience requirement some public health agencies impose. This literature review will synthesize the existing literature (or lack thereof) concerning new graduate RNs in public health. It will present the benefits of hiring new graduate RNs into public health, as well as detail the support that new graduate RNs need to be successful.

**Rajkowski, Holst:** Independent Dementia-associated Behavior Interventions Approach Long-term care facilities often care for residents that have a diagnosis of dementia since it most often manifests in older adulthood, which is the majority of the population seen in these facilities. Although the disease manifests in different ways common behaviors that occur include wandering, becoming verbally and physically aggressive, denying assistance with cares, refusing cares, weeping, delusions, disorganized thinking, inappropriate use of call lights, and indecent exposure. Healthcare staff often find it difficult to manage these behaviors, as many residents with dementia are difficult to re-direct due to the disease process. Recent literature examines the effectiveness of using multiple non-pharmacological interventions that have been personalized based on resident history and personality. The aim of this practice improvement project is to determine the effectiveness of an individualized behavior management program on dementia-associated behaviors at a local nursing home. Resident profiles were generated by gathering subjective data from family, looking at past activity involvement, and staff report. Individualized activities were then created for the participating residents that the healthcare staff will be able to utilize when dementia-associated behaviors occur.

**Zasmeta, Hoheisel, Gnahn, Smith, O'Brien, Kahl:** The use of antipsychotic medications in older adults can result in numerous adverse consequences such as tardive dyskinesia, and increased falls. Patients receive these medications to control behaviors associated with conditions like dementia, bipolar disorder, and schizophrenia. One way to reduce the use of antipsychotic medications is to implement non-pharmacological interventions when behaviors become present. This project will evaluate the effectiveness of non-pharmacological interventions on patients in a memory care unit of a nursing home. If these interventions are effective
in the management of adverse behaviors, a reduction in the use of antipsychotic medications can be achieved while increasing patient safety.

O’Donnell, Shipp, Reiner: Pain management in a skilled nursing facility has not been managed adequately in post-surgical patients. Medicare uses the Minimum Data Set (MDS) as a means to compare similar facilities on Quality Measures. Medicare flags issues that reach the 75th percentile and decreases reimbursement rates based on the facilities scores. Short-term stay pain management is an emerging issue for this facility being that it is currently ranked in the 70th percentile. The aim of this quality improvement project was to implement an additional assessment tool to adequately assess pain. Skilled nursing facility staff who provide direct patient care were surveyed and observed assessing pain in post-surgical patients. The data was then compiled to identify failures or lack of pain assessment. This data was then used to introduce an additional assessment tool.

Nutrition

Schedule

8:00 - 8:20 AM  
ASC 142  
Emily R. Lueck (Amy Olson, Nutrition) The Correlation Between Serum Vitamin D Levels, Sprint Times, and Muscle Recovery in Division II and III Collegiate Basketball Players

8:20 - 8:40 AM  
ASC 142  
Nicole M. Pagel (Amy Olson, Nutrition) THE EFFECT OF CAFFEINE ON MOOD AND MEMORY IN FEMALES GETTING ≤ 6 OR ≥ 8 HOURS OF SLEEP

8:40 - 9:00 AM  
ASC 142  
Tori M. Grootwassink (Amy Olson, Nutrition) NUTRITIONAL KNOWLEDGE AND NUTRITIONAL PRACTICES OF DIII COLLEGIATE DANCERS

8:40 - 9:00 AM  
ASC 142  
Maren E. Iverson (Amy Olson, Nutrition) FLUORIDE CONCENTRATION OF TEAS CONSUMED BY COLLEGE STUDENTS DURING FALL 2014

9:00 - 9:20 AM  

Abstracts

**Lueck:** Winter indoor athletes have a greater risk of low serum vitamin D concentrations. Low serum vitamin D levels are associated with impaired muscle...
function and recovery and greater risk of muscle injury. Purpose: To determine if there is a correlation between serum vitamin D levels and muscle recovery in Division II and III Collegiate Basketball Players. Methods: healthy varsity basketball players (26 male/30 female) were tested during the first week of January. Approval was obtained by the Institutional Review Boards of two colleges and one university. The athletes signed an informed consent. Blood samples were taken via finger stick to analyze serum 25-hydroxyvitamin D3 (25(OH)D) concentrations using an ELISA assay. Participants completed a questionnaire about their supplement use, intake of vitamin D food sources, and tanning. Muscle recovery was assessed by two performance tests, the ability to maintain sprint speed (3 x 20-meter sprints) and jump height (3 x vertical jumps). Results: The mean serum 25-hydroxyvitamin D3 (25(OH)D) concentration was 68 ±37 nmol/L. Most participants (54%) were vitamin D insufficient (defined as 35-75 nmol/L), 37% vitamin D sufficient (defined as >75 nmol/L), and 9% were vitamin D deficient (defined as <35 nmol/L). The players with sufficient vitamin D levels either tanned once a week, consumed an extreme amount of fatty fish or fortified milk, or took a daily vitamin D supplement. Vitamin D sufficient subjects had a trend towards faster sprint times compared to vitamin D insufficient subjects; however, the difference was not statistically significant (Males, p=0.278), (Females, p=0.157). Serum vitamin D negatively correlated with jump heights (p=0.001). Conclusion: Inadequate levels of Vitamin D were identified in 63% of division II and III collegiate basketball players. Individuals’ serum vitamin D levels did not correlate with faster sprint times or higher jump heights in this study. The 20-meter sprints and vertical jumps, while appropriate for basketball players, were perhaps not intense enough to measure changes in muscle recovery. Only 7% of the players had optimal serum D levels (>120 nmol/L) which restricts the range of values. Vitamin D supplementation may be the best solution to achieve optimal serum D levels.

Pagel: Sleep deprivation is one of the top five threats to academic achievement. Unfortunately, college students often lack adequate quantity and quality of sleep. Many students use caffeinated beverages as a stimulant source in an attempt to make up for their lack of sleep. PURPOSE: to determine whether caffeine can compensate for a lack of sleep regarding mood and memory in students getting either ≤ 6 or ≥ 8 hours of sleep per night. METHODS: Institutional Review Board approval was obtained. A sleep questionnaire, linked to a recruitment email, was sent to sophomore, junior, and senior females at the college (n=57). Habitual sleep patterns were used to assign participants to one of two groups, ≤ 6 hours (N=12) or ≥ 8 hours (N=15). Exclusion criteria were smoking, medications (excluding birth control), and caffeine sensitivity. Subjects read and signed an informed consent before participating in the study. Subjects consumed a flavored beverage in two trials, once with caffeine (200 mg) and once without, in a double-blind crossover design. Working memory was assessed by a word recall task. Mood was assessed by a
self-reported mood questionnaire, which contained six positive and six negative symptoms, each scored from 1-5, for a total of 30 points. A 2 X 2 mixed ANOVA through SPSS was used to analyze the data. Correlation coefficients were used to analyze sleep patterns and GPA. RESULTS: The mean number of words recalled increased by 3% with caffeine treatment in subjects sleeping ≤ 6 hours and by 8% in the group sleeping ≥ 8 hours (p=0.081). Positive mood scores increased by 2.3% with caffeine treatment in the group sleeping ≤ 6 hours and by 17.7% in the group sleeping ≥ 8 hours (p=0.011), with a statistically significant interaction between the sleep group and treatment (p=0.042). Negative mood scores decreased by 9.7% with caffeine treatment in the group sleeping ≤ 6 hours and by 2.7% in the group sleeping ≥ 8 hours (p=0.03). CONCLUSION: Caffeine improved mood and memory in both groups but was less effective in the group lacking adequate sleep. Therefore, caffeine cannot completely compensate for a lack of sleep as maximal improvement was achieved by the group obtaining ≥ 8 hours of sleep per night.

Grootwassink: Professional ballet dancers on average weigh 10 to 20% below ideal weight (1). The NCAA does not monitor collegiate dance teams, so body weight and nutritional practices of collegiate dancers is relatively unknown. Purpose: To determine if the collegiate dancers are considered at risk for developing an eating disorder and to assess nutritional misconceptions. Methods: 25 Division III female dance team members participated in the study. Approval from the Institutional Review Board (IRB) was obtained, and subjects completed an informed consent. Subjects were asked to complete an electronic survey that was distributed via email. The electronic survey included questions from the EAT-26 and a nutritional knowledge questionnaire. Subjects were asked to complete an ASA-24 electronic 24-hour recall. Correlations were analyzed using a bivariate correlation and unpaired t-test with Service Product for Statistical Solution (SPSS). Results: EAT-26 scores averaged 4.56 +/- 6.7 indicating a low risk for an eating disorder (n=25). Only one dancer indicated a high risk with an EAT-26 score of 31. There was a strong, though statistically insignificant, correlation between the EAT-26 score and nutritional knowledge (r=-0.307, p=0.068, n=25). Participants (n=25) scored, on average, 66% on the nutritional knowledge questionnaire; however, those who had taken a nutrition course scored significantly higher, 76% (t = 2.3695, p = 0.0266, df = 23). Only 17 dancers completed the ASA-24. Participants consumed 1747 +/- 630 kcals, including 61.5 +/- 26g protein, 70.7 +/- 34 g fat, and 216.7 +/- 71g carbohydrates, in a 24-hour period. Dancers consumed an inadequate amount of calcium (47%), vitamin C (71%), vitamin B6 (47%), iron (94%), and vitamin D (100%) (n = 17). Conclusion: While overall diets appeared to meet most RDA recommendations, intakes varied extremely and 41% failed to obtain at least 50% of the RDA for more than one nutrient. Improving nutritional knowledge and healthy food choices could decrease eating disorder risk in DIII collegiate dancers.
Iverson: Fluoride is added to community water sources to prevent dental caries. However, excessive fluoride intake may contribute to dental and/or skeletal fluorosis. The incidence in fluorosis is increasing due to fluoride sources in the diet and the addition of fluoride into water supplies. The optimal intake of fluoride is between 0.05 and 0.07 mg per kg body weight per day. 1 Tea (Camellia sinensis), one of the world’s most consumed beverages, can contain high levels of fluoride but it is recommended due to its many health benefits. Purpose: To determine the concentration of fluoride in popular teas and the amount of tea consumed by the college-aged population. Methods: An anonymous survey was distributed electronically through email after Institutional Review Board approval (n = 1815). Participants (98 females and 30 males) completed a survey assessing beverage consumption. Informed consent was the first page of the survey; consent was implied by completing the survey. Survey results directed the selection of teas to analyze. Five types of tea from five brands were purchased from local grocery stores. Each tea was brewed in 240 ml of boiling water for 3 minutes in triplicate. Teas were analyzed for fluoride concentration using a fluoride ion-selective electrode. Two-way ANOVA was used to examine the effect of tea type and flavor on fluoride concentration. Results: The mean fluoride concentration for green tea was 7.0 mg/L (SD = 2.6), black tea 4.8 mg/L (SD = 3.0), citrus tea 0.3 mg/L (SD = 0.2), fruity tea 0.3 mg/L (SD = 0.1), and floral tea 0.3 mg/L (SD = 0.1). Two-way ANOVA yielded a statistically significant interaction between the effects of tea type and flavor on fluoride concentration [F (16, 50) = 27.025, p = .000]. The fluoride concentrations were statistically different among black tea brands [F (4) = 100.768, p = .000], green tea brands [F (4) = 16.100, p = .000], and citrus tea brands [F (4) = 8.269, p = .003]. Fluoride concentrations were very low and did not differ among fruity [F (4) = 1.540, p = .264] and floral tea brands [F (4) = 4.028, p = .034]. Seventy-five percent of the college-aged population consumed 6 or less tea beverages per week, while two percent consumed 21 or more tea beverage. The most commonly consumed types of tea consumed are green (70.4%), black (59.2%), floral (46.4%), fruity (45.6%), and citrus (38.4%) (participants indicated all types of tea that they consume). Conclusion: The fluoride concentration of tea type varies with brand with black and green teas containing the most fluoride and citrus, fruity, and floral teas containing very low fluoride. Three or more green or black tea beverages per day provides 5.11-7.45 mg/L, which exceeds 0.05-0.07 mg fluoride concentration per kg per day, the optimal intake of fluoride (assuming a 68 kg college-aged student and 12-ounce beverage). Three participants consume more than the optimal intake of fluoride from tea alone. The majority of the college-aged
population is not at risk for excess fluoride intake based on tea consumption alone; however, fluoride concentrations should be listed on nutritional labels so that consumers can make informed decisions regarding their health.


Guajardo: Mexico began the iodization of salt in 1960, which dramatically reduced the incidence of goiter, but in the last year the incidence of goiter tripled in the state of Jalisco. PURPOSE: Assess iodine knowledge of the people and concentration of iodine in salt samples in rural and urban localities of Jalisco, Mexico to explain the rise in goiter incidence. METHODS: IRB approval was granted for this cross-sectional study. A convenience sample of 50 individuals, men and women older than 18, were selected from a rural and urban locality of Jalisco. The 100 individuals that completed a survey answered questions about demographics, medical history, iodine knowledge, and iodine dietary sources. A total of 130 salt samples were collected for potassium iodate (KIO3) analysis, 50 from each locality, and 30 were newly purchased samples. KIO3 concentration was measured by titration method, using a kit supplied by Boiteccsa Laboratorios in Sonora, Mexico. SPSS was used to conduct ANOVA, T-tests, and Coefficient Correlation statistical analyses. RESULTS: Surprisingly, 32% of the rural salt, 22% of urban, and 11% of fresh salt samples had no iodine. Only 24% of rural salt samples contained adequate levels (15-40 mg/kg) and only 38% of urban samples. Only 8% of newly purchased salt had the correct amount of iodine as indicated on the label, 48% had less iodine, and 33% had excess potassium iodate (>40 mg/kg). Sadly, 88.1% of rural and 81.6% of urban residents did not know that pregnant women have higher iodine needs, and only 53% of rural and 56% of urban residents know that a lack of iodine can cause goiter. In addition, 78% of urban and 48% of rural residents used non-iodized sea salt. Education levels varied between rural and urban areas; however, education did not determine iodine knowledge (p value ≥ 0.5).

CONCLUSIONS: Even though Mexico mandates the iodization of salt, most of the salt samples did not meet the recommended potassium iodate concentration. Increased consumption of non-iodized sea salt and great variation in KIO3 concentrations in salt may explain the recent increase in goiter incidence. Iodizing sea salt might be an acceptable solution.

Lasswell: The public health initiative to reduce blood pressure by reducing sodium intake has led to a reduction in salt consumption. However, iodized salt is the best source of iodine in American diets. Purpose: To determine the dietary sources of iodine and knowledge about iodine in college-aged women. Methods: The Institutional Review Board granted approval for this cross-sectional study and
participants signed informed consent before beginning study. College-aged female juniors and seniors (n=195) completed a questionnaire to assess iodine knowledge and dietary intake. The survey contained questions about iodine and dietary intake, including use of iodized salt, foods high in iodine, multivitamins and supplements. A One-Way ANOVA, a post hoc test, and descriptive statistics were used to analyze survey results. Results: The Recommended Daily Allowance of 150µg was met by 38.1% (n=76) of participants by food sources alone and was met by 46.6% (n=88) of participants when taking a multivitamin. Iodine content of multivitamins ranged from 0 µg to 200 µg. Although 58% of women report owning iodized table salt, only 24% report more than occasional use of salt. Nutrition and nursing majors have a stronger knowledge base regarding iodine than students in other majors (p=0.004). However, there was no significant correlation between iodine knowledge and the total amount of dietary iodine (p=0.083). Milk is the primary contributor of iodine in women’s diets; the average iodine intake provided by milk was 40.7 ± 47.2 µg. Conclusions: Less than half of college-aged women are iodine adequate. Survey responses indicated pressure to avoid salt, so the low dietary iodine intake may be due to conscious restriction of salt, as well as not recognizing food sources of iodine. Iodized salt in moderation can contribute an important source of iodine; in addition, women can meet the recommended daily allowance (150 µg) by consuming 3 cups of milk, 2 cups of yogurt or 5 whole eggs, or some combination. Multivitamins help to meet the requirement but not all vitamins contain the same amount of iodine, so careful reading of supplement labels is necessary.

Schroeder: Stress, lack of sleep, and the desire to succeed academically, may contribute to caffeine use. A single dose of 100-200 mg caffeine is optimal for cognitive benefits. Excessive intake may contribute to less sleep, greater stress, and poor academic performance. Purpose: To assess the current caffeine consumption by junior and senior college students and the relationship between caffeine consumption and daytime sleepiness, perceived stress, and academic success. Methods: Approval was obtained from the Institutional Review Board (IRB). An anonymous, self-administered, electronic questionnaire was distributed by IT Services to 1,815 students. The first page contained the informed consent and 327 students responded. Data collected included current caffeine consumption during a typical week, cumulative GPA, sleepiness, and perceived stress. Daytime sleepiness was assessed using the Epworth Sleep Scale (ESS) and perceived stress was assessed using the Perceived Stress Scale (PSS). Results: Average caffeine consumption reported was 303 ± 173 mg [range= 0-1878]. Only 11 respondents [0.03%] reported not consuming caffeine. Coffee is the major source of caffeine (n=236). The majority of caffeine was consumed in the morning and afternoon (n= 231 and 200, respectively) in comparison to the evening and night (n=108 and 51, respectively). The average score of the ESS from both males and females was 8 ± 4 on a scale of 0-24 indicating an average amount of daytime sleepiness [range= 0-20].
Scores from 10-15 are considered excessive daytime sleepiness. The average score of the PSS from both males and females was 18 ± 6 on a scale of 0-40 indicating low-medium stress [range= 0-33]. Only energy drinks correlated with having a higher GPA (p<.0001). There was no statistical significance between total caffeine consumption and daytime sleepiness (F-ratio= 0.5521), total caffeine consumption and perceived stress (F-ratio= 1.4001), or total caffeine consumption and GPA (F-ratio= 3.2126) (α 0.05). Males consume more energy drinks than females (p=0.0118). Conclusions: The average amount of caffeine reported is not excessive and caffeine does not correlate with stress, daytime sleepiness, or GPA [except for Energy Drinks]. The majority of students are consuming less than 200 mg caffeine/day; 18% of students consume between 200-400 mg/day (n=60); 75% consume under 200 mg/day (n=245); and 7% consume more than 400 mg/day (n=22). The highest intake was 1,878 mg/day which may be a concern.

**Biel:** Beetroot juice, a natural ergogenic aid, can decrease the amount of oxygen required for a given exercise. The effects of beetroot juice have been tested on male cyclists and cross-country skiers. However there is limited research regarding the ergogenic benefits of nitrates for hockey players or women of any sport. Purpose: To test the potential aerobic benefits of beetroot juice on male and female DIII College hockey players using the Yo-Yo intermittent recovery 2 test. Methods: IRB approval and informed consent was obtained before testing started. Seven female and nine male varsity hockey players completed a double-blind, crossover design study. Participants consumed single dose of 6.2 mmol of concentrated, nitrate-rich beetroot juice or nitrate-depleted beetroot juice (Beet It; James White Drinks Ltd., Ipswich, United Kingdom) 2.5 hours prior to completion of a Yo-Yo IR2 test. The Yo-Yo IR2 test is an aerobic test that measures the ability to perform repeated exercises while utilizing a large contribution from the anaerobic system. Participants continued the Yo-Yo IR2 test until they were unable to keep pace with beeps. The total distance completed during the test was recorded. The Wilcoxon signed rank test was used to determine statistical significance within the individual teams Results: Total distance completed was 10% greater in males with the nitrate-rich beetroot juice (667 ± 174 m, p = 0.022) and 17% greater with the nitrate-depleted beetroot juice (724 ± 175 m, p = 0.014) compared to the control group (600 ± 151 m). Total distance completed by the females was not significantly different for either the nitrate-rich beetroot juice (446 ± 127 m, p = 0.612) or the nitrate-depleted beetroot juice (491 ± 149 m, p = 0.091) compared to the control (457 ± 140 m). Conclusion: A single dose of beetroot juice with 6.2 mmol nitrates did not significantly improve aerobic performance as measured by the Yo-Yo IR2 test in hockey players. The product Beet It allowed for successful blinding and provided the nitrates in 70 mL; perhaps supplementation over an extended period of time could reveal different results.
Stangl: Addiction to highly refined foods, specifically sugar, may result in excessive caloric intake, which enhances comorbidity risks, such as obesity and cardiovascular disease. The American Heart Association recommends that women limit “added sugar” intake to 25 g per day (1). Purpose: To determine the relationship between food addiction and sugar consumption. Methods: IRB approved the study, and IT Services sent out a recruitment email to 1992 college-aged females. Participants gave their informed consent and completed two surveys: the Yale Food Addiction Scale (YFAS) (n=160) and the Automated Self-Administered 24-hour dietary recall (ASA24) (n=57). The YFAS questionnaire categorized individuals into two groups based on the DSM-IV substance abuse criteria: food dependents, or food addicts, and non-food dependents, or non-food addicts. The ASA24 analyzed participants’ dietary recalls of all foods/beverages consumed in the last 24 hours. T-tests and ANOVAs compared nutrition intakes of food dependents with non-food dependents. Results: The YFAS categorized the respondents as 31.3% food dependent (n=50) and 68.8% non-food dependent (n=110); 13 food dependents and 44 non-food dependents completed the ASA24. Only 35.6% of participants (n=57) complete both surveys. The range of “added sugar” consumed was 0 – 395 grams. Food addicts consumed 77.5 ± 101.5 g of “added sugar” and non-food addicts consumed 51.5 ± 36.5 g of “added sugar”; however, there was no statistical difference between groups (p=0.158). Food dependents consumed less sodium than non-food dependents, 2308 ± 681 mg and 2980 ± 1051 mg sodium respectively, which was statistically significant (p=0.034). Conclusions – A food addiction diagnosis did not correlate with a higher “added sugar” intake in this study (p>0.05), and food addicts consumed a significantly lower amount of sodium than non-food addicts (p=0.034). A surprising percent of college-aged females were categorized as food addicts (31.3%), which is higher than other reports (8.8%). Most food addicts and non-food addicts (70%) are consuming more than the American Heart Association’s recommended amount of “added sugar” (<25 grams per day).

http://www.heart.org/HEARTORG/GettingHealthy/NutritionCenter/Sugars-101_UCM_306024_Article.jsp

Ulveling: Caffeine demonstrates ergogenic benefits with a dose of 3 to 6 mg/kg of body weight. The NCAA bans caffeine in concentrations over 15 µg/ml in urine. However, the amount of caffeine an individual can consume before reaching the legal limit is unclear. Purpose: To assess the rate of caffeine excretion in different individuals using a single dose of 300 mg. Methods: IRB approved this research and 19 college students (4 males; 15 women) agreed to participate and signed informed consents. The participants refrained from caffeine 4 hours prior to the testing
period. Each student consumed 300 mg of caffeine with 12 oz. of Crystal Light, representing a range from 3.4 to 5.0 mg/kg. Urine samples were collected 1, 2, 3, and 4 hours post consumption. Specific gravity and urine volumes were recorded for each sample to assess hydration status. An ELISA Assay was used to analyze the caffeine concentration. A link to an online survey was emailed to the collegiate population assessing physical activity, caffeine products used and reasons for caffeine consumption. Repeated one-way ANOVA and bivariate analysis was used to assess significance. Results: Peak caffeine concentrations were reached at hour 3 (10.8 +/- 3.3 μg/ml). The mean caffeine concentration at hour 1 was 7.8 +/- 3.8 at hour 2 was 10.3 +/- 2.8 at hour 3 was 10.8 +/- 3.3 at hour 4 was 10.1 +/- 4.2 and only hour 1 and 2 were significantly different (p = 0.016). Five females (148.2 +/- 6.6 lbs.) exceeded the NCAA upper limit. The females received approximately 4.5 mg of caffeine /kg of body weight. The participants came to the lab well hydrated (specific gravity, 1.0053 +/- 0.0049) and stayed well hydrated (1.0075 +/- 0.0043) throughout the study. Caffeine use was reported by 89.2% of individuals (n=351), but only 9.7% of the respondents reported using a pre-workout supplement and only 11% use caffeine for its ergogenic benefits. Males were more likely than females to use caffeine pre-workout supplements and use caffeine to enhance performance (16% males; 4% females). Conclusions: A dose of 300 mg of caffeine resulted in 21.5% of the individuals exceeding the 15-μg/ml NCAA threshold, approximately the content of a 16oz Starbucks.

Ford: Pre-workout products are some of the most aggressively marketed supplements and typically contain caffeine, creatine and other proposed ergogenic ingredients. Research supporting these products and whether a combination of ingredients enhances anaerobic performance any better than caffeine alone is limited. Purpose: 1) To determine if a single dose of a National Science Foundation (NSF) safe pre-workout supplement is more effective than caffeine alone at enhancing anaerobic performance, and 2) To determine the knowledge and use of nutritional supplements by DIII football players. Methods: IRB approval and informed consents were obtained for this double-blind, crossover study. Players (n=12) were recruited to participate in the pre-workout supplement study comparing a placebo, caffeine only and pre-workout supplement (Extreme Edge Pre-workout formula). Subjects completed three anaerobic tests including: maximum repetition bench press test at 50% of max weight, a vertical jump test, and three electronically timed 40 yard sprints. A one-way analysis of variance (ANOVA) was used to determine significance of mean bench press reps, vertical jump heights and sprint times. An anonymous survey was administered electronically to a DIII football team to assess basic knowledge and use of nutritional supplements (n=96). Results: The pre-workout supplement did not statistically improve anaerobic performance in maximum bench reps [M= 18.3 reps, SD= 4.62, p = 0.941], average vertical jump height [M=26.36 inch, SD= 3.32, p =
0.973] or average sprint time \([M=5.37 \text{ sec}, SD= .488, p = 0.991]\). Many football players (54.3%) report using nutritional supplements; 82.8% of the supplements were protein powder, 51.3% creatine, and 42.3% were pre-workout supplements. Despite widespread use, 34% of players did not know the role of creatine and 67% did not know the function of caffeine in the body. Conclusion: Many players use nutritional supplements; however, a single dose of the Extreme Edge Pre-workout Formula was not more effective than caffeine alone or placebo in enhancing anaerobic performance. Although single use of this pre-workout supplement did not improve performance, the effects of long term use were not determined. Based on the results of this study, the benefits of this product do not appear to be worth the high cost.

Lee: The relationship between eating breakfast, grades, and Body Mass Index (BMI) has not been extensively studied among college students; however, weight gain during college years is common. Purpose: To determine if college students who eat breakfast have lower body weights and higher Grade Point Averages (GPAs).

Methods: The Institutional Review Board approved this study. All juniors and seniors were invited to participate. Information Technology sent out emails to all potential participants with the informed-consent document and links to a Forms Manager survey and the Automated Self-Administered 24-hour (ASA24) dietary recall survey. The Forms Manager survey collected data regarding breakfast intake, GPA, BMI, and physical activity. The ASA24 survey collected data regarding participants’ 24-hour total dietary intake. SPSS was used to analyze data, using the t-test, oneway ANOVA, and chi-squared test. Results: 80.2% \((n=158)\) of subjects were regular \((4+ \text{ times per week})\) breakfast consumers. Only 35% of the 197 initial participants completed the ASA24 dietary recall. The final population consisted of 69 subjects, of whom 78.3% \((n=54)\) regularly ate breakfast. Most breakfast eaters, 72.9% \((n=43)\), consumed breakfast in their apartment, and 27.1% \((n=16)\) consumed breakfast in the school cafeteria. Subjects who ate breakfast in the cafeteria tended to consume more total calories \((2088\pm1235)\) than subjects who ate breakfast in their apartment \((1821\pm799)\), and more cholesterol was consumed in the cafeteria \((352\pm253 \text{ mg})\) than in the apartments \((228\pm179 \text{ mg})\) \((p = 0.051)\).

Participants who consumed breakfast in apartment consumed more whole fruit \((1.29\pm1.42 \text{ servings})\) compared to participants who ate breakfast in school cafeteria \((0.73\pm0.84 \text{ serving})\). Over half of the participants, 63%, gained weight while at college, with the majority \((45.6\%, n=57)\) gaining 6-10 lbs. Individuals who consumed breakfast had slightly lower BMIs \((23.3\pm2.9)\) in comparison to breakfast skippers’ BMI \((24.3\pm4)\) \((P = 0.012)\). Subjects who engage in physical activity more often \((5\pm0.97 \text{ days/wk})\) tended to consume more total calories \((1924\pm857)\) than subjects \((1858\pm928 \text{ calories})\) who are less active \((2.33\pm0.29 \text{ days/wk})\) \((p = 0.822)\), although both groups consumed a similar range of breakfast calories. Subjects who consumed a lower protein \((10.9\pm5.6 \text{ g})\) breakfast tended to have lower GPAs.
(3.47±0.31) than subjects who ate a higher protein (28.33±9.06 g) breakfast (GPA 3.56±0.32) (p =0.630). Breakfast meals with lower protein (10.9±5.6 g) also correlated with higher BMIs (23.9±3.6) while individuals consuming breakfasts with higher protein (28.3±7.6 g) had lower BMIs (22.5±1.2) (p = 0.002).

Conclusions: Surprisingly most students, 80%, reported eating breakfast regularly and people who eat breakfast have slightly lower BMIs. Individuals who ate more than 19 g of protein in their breakfast meal had slightly lower BMIs and higher GPAs. Individuals who ate in their apartment tended to consume fewer total calories and less cholesterol, and more fruit intake compared to their peers who ate in the school cafeteria.

Physics

Schedule

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<td>9:30 - 10:00 AM</td>
<td>PEngl 167</td>
<td>Kaela Kopp (Dean Langley, Physics)</td>
<td>A Theoretical and Experimental Analysis of Compton Scattering using a Gamma Spectacular</td>
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<td>10:00 - 10:30 AM</td>
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<td>Zachary D. Minea (James Crumley, Physics)</td>
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<td>10:30 - 11:00 AM</td>
<td>PEngl 167</td>
<td>Joseph E. Hoppert (Thomas Kirkman, Physics)</td>
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<td>11:00 - 11:30 AM</td>
<td>PEngl 167</td>
<td>Jacob Marsnik (Todd Johnson, Physics)</td>
<td>Electric Guitar Pickups - Does the Magnetic Material Affect the Sound?</td>
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Abstracts

Kopp: This project examined the process of Compton Scattering and developed a photon scattering apparatus for use in future nuclear laboratory experiments. The project examined the comparison of the theory of Compton scattering with the experimental data collected using the photon scattering apparatus, NaI(Tl) Gamma scintillator detector, Gamma Spectacular GS-1100 PRO, and gamma ray sources, Na-22, Cs-137, Co-57, Mn-54, Co-60, Ba-133, and Cd-109. Data from the
sources was collected through Pulse, Recorder and Analyzer software that converts a USB sound drive into a multi-channel analyzer of the detected Gamma waves. Pulse-Height histograms for each of the sources, detected at different angles, are compared to the known energies of two different sources to calibrate the apparatus. This calibration is then used to approximate the bin numbers of the expected or known energy peaks for randomly selected sources. Calibration of the scattering apparatus with the Gamma Spectacular GS-1100 PRO demonstrates the expected linear relationship between energy and bin number with little error between experimental and theoretical results. Further measurements were obtained to examine the capability of the sources and detector used and to estimate the amount of the source needed strong, defined Compton scattering plots. This laboratory equipment should be useful for future experimentation by using the data collected to approximate energies from the bin with the most significant peak(s) and identify the unknown source. Further experimentation with the intention of increasing accuracy in the apparatus and detector could be improved using larger Gamma sources and a more regulated atmosphere.

Minea: The focus of this project is meteors and the comparative data analysis of prominent meteor showers and their corresponding radiant. During a meteor shower, meteors can be traced back to a particular point in the sky. This phenomenon is called meteor radiant. At CSB/SJU there is an All-Sky Camera where meteor occurrences have been detected and recorded since 2009. The data collected is the position of the meteor and the amount of time it is visible. Using this data, meteor radiant can be calculated. The particular meteor showers being analyzed are Orionids, Leonids, Geminids, Quadrantis, Lyrids, and Perseids. Each of these meteor showers originate from a comet or asteroid debris trail, and appear near certain constellations in the night sky. Using the calculated coordinates of the meteor radiant, we can compare the CSB/SJU recorded data with the location of the known particular constellation.

Hoppert: In 2007, Antipin, Sokolovsky, and Ignatieva discovered the first eclipsing binary with a Type II Cepheid component in our Galaxy, ASAS182612. We present the analysis of ASAS182612's pulse and orbital periods from 2007 to 2014 using B, V, R, and I filters. The pulsation and orbital periods were found to be 4.1622 ± .0003 days and 51.366 ± .025 days, respectively. The angular acceleration of the pulse period was determined to be 1.1E-6 ± 1E-7 rad/day2.

Marsnik: This experiment aimed to investigate the difference in the sounds produced by electric guitar pickups fitted with either ceramic or AlNiCo magnets. Many guitar players claim that there is a noticeable difference, specifically that ceramic pickups tend to have a “brighter” or “harsher” sound while AlNiCo pickups have a “warmer”, more “mellow” sound. Pickups convert the mechanical wave of
string vibration into an alternating current signal. In order to measure any effect the magnetic material may have on the sound produced, electric signal data was collected for each type of magnet and differences between the harmonic spectra produced were sought. Since there was no significant difference between the two pickups, this experiment suggests that the magnetic material used in a guitar pickup is not the cause of any perceived difference in the sound of the instrument.
Social Sciences Presentations:

Accounting & Finance

Schedule

8:00 - 8:20 AM
Simns 340
Anh Q. Tran (Warren Bostrom, Accounting & Finance)
Tax Consequence of Legalizing Marijuana in Minnesota

8:00 - 8:20 AM
Simns 340
Justin D. Hoffman-Szucs (Warren Bostrom, Accounting & Finance)
Financial implications of welfare benefits

8:00 - 8:20 AM
Simns 340
Megan Brettingen (Warren Bostrom, Accounting & Finance)
Financial Stress of College Students/Graduates

8:00 - 8:20 AM
Simns 340
Colin J. Charpentier (Warren Bostrom, Accounting & Finance)
The F-35 and military spending

8:00 - 8:20 AM
Simns 340
Mitchell S. Ergen (Warren Bostrom, Accounting & Finance)
The Real Cost of Cloud Computing

10:00 - 10:20 AM
Simns 310
Joshua Jenson (Warren Bostrom, Accounting & Finance)
The Relationship between CEO Compensation and Company Performance

10:00 - 10:20 AM
Simns 310
Parker J. Osborne (Warren Bostrom, Accounting & Finance)
Value of ESOP’s in Public Company Performance

10:00 - 10:20 AM
Simns 340
Nicholas Liapis (Warren Bostrom, Accounting & Finance)
Should Division 1-A Football Players be Paid
Simns 310  Philip J. Johnson (Warren Bostrom, Accounting & Finance) Impact of an Increasing Minimum Wage on Teenagers

10:00 - 10:20 AM  Simns 340  Jacob Shrode (Warren Bostrom, Accounting & Finance) Happiness & Accounting/Finance Careers

10:00 - 10:20 AM  Simns 340  Jennifer Gonia (Warren Bostrom, Accounting & Finance) Investing in Broadway Musicals

10:00 - 10:20 AM  Simns 310  Isaac Winters (Warren Bostrom, Accounting & Finance) Minimum Wage's Effect on Economic Factors

10:00 - 10:20 AM  Simns 340  Garrett N. Zeltinger (Warren Bostrom, Accounting & Finance) Correlation Between Baseball Player Salaries and Offensive Performance

10:00 - 10:20 AM  Simns 340  Tyler W. Magedanz (Warren Bostrom, Accounting & Finance) Organic Agriculture in a Modern World

10:00 - 10:20 AM  Simns 310  Alex M. Toninato (Warren Bostrom, Accounting & Finance) The Effects of Employee Ownership on Worker Productivity and Company Performance

10:00 - 10:20 AM  Simns 340  Brett L. Becker (Warren Bostrom, Accounting & Finance) The Effects of Building New Stadiums in Major League Baseball

Abstracts

Tran: Analyze marijuana sale tax revenue in Colorado and project the marijuana sale tax revenue that could be generated from legalizing recreational marijuana in Minnesota.
Hoffman-Szucs: I will be studying how welfare affects unemployment on a state by state basis.

Brettingen: Students are forced to think about their finances when applying to colleges or thinking about what career they want to go through with in the future. I conducted a survey for college students and recent graduates to determine their financial stress state. This survey helped me in finding relationships between many variables regarding financial stress.

Charpentier: This presentation will compare the F-35 to current platforms and draw conclusions on if the amount spent is worth the value obtained and if this is an indication of valid or invalid military spending practices.

Ergen: A thorough cost-benefit analysis of cloud computing in a company. This includes the differences between an on-premise solution and a cloud-based solution, as well as, an analysis of who truly benefits from each of these solutions.

Jenson: After the 2008 recession, CEO compensation fell under a lot of scrutiny. This project assesses whether company performance has an effect on CEO compensation. A quantitative analysis using actual CEO compensation compared to the company performance is used to assess the relationship.

Osborne: My project looks into whether having an ESOP is beneficial when looking at company performance. I look into public companies and analyze things such as stock price growth, profit margins, and asset turnover, and I match this with competitor companies to see how they compare.

Liapis: I will be analyzing the financial impacts of paying these college football players. I will use these facts to reach a conclusion about whether or not these athletes should be paid.

Johnson: A research based study on whether or not an increasing minimum wage is helping or hurting teenagers. The study involves comparing the labor force participation rate to the federal minimum wage to find out whether it impacts teenagers in a negative or positive way.

Shrode: There are a lot of different options for students majoring in accounting. My goal is to find out the happiness levels of people who majored in accounting and are in different fields. To do this I did a survey that included the Oxford Happiness Questionnaire, among other questions.
Gonia: I am presenting an aggregate of key factors that help guarantee the financial success of a musical production. I have a set of musical productions considered successes and failures based on profits. I then apply an aggregate of key factors to each in a conclusion of what determines the financial success of a musical production.

Winters: Minimum Wage is increasing across the country. As an investor or business owner it is crucial to understand how this could affect economic factors, thus possibly changing future business decisions. I will explain if there is a correlation between Minimum Wage and economic factors.

Zeltinger: I will be looking at a wide variety of baseball players’ salaries in Major League Baseball and comparing them to various offensive statistics to determine if there is a correlation between the two.

Magedanz: Is organic food worth the price premium paid, and how does organic agriculture affect the overall sustainability as world population is projected to rise to over 9 billion by 2050.

Toninato: I am looking at different employee ownership plans focusing mainly on ESOPs and ESPPs and some of their different effects on worker productivity and company performance. I am analyzing the differences in employee motivation and productivity for companies with ownership plans and with companies that don’t have ownership plans. Also, I am comparing differences in sales growth, profitability, and stock price growth for companies that do have ownership with companies that don’t have ownership.

Becker: What are the benefits and detriments of building a Major League Baseball stadium for the traditional tax-payer, regardless of baseball interest?

Global Business Leadership

Schedule

11:00 - 11:30 AM  
Simms 360  
Carolyn A. Bedford, Karly Knutson, Theordore Kline, Andrew Lynch, Martynec Kyle-Benjamin (Stephen Schwarz, Global Business Leadership) SAM’s 3D Systems: "Stuck in the Middle" of the 3D Printer Boom

Abstracts
Bedford, Knutson, Kline, Lynch, Kyle-Benjamin: Our team explored individually, and as a group, strategic management issues and analyzed in order to prepare for our competition/presentation in March. Other preparations included the review of previous case studies, familiarizing ourselves with financial and statistical models to be used, staying current on business news, considering presentation ideas, and meeting with Global Business Leadership professors. In January our team was assigned to a case study on 3D Systems. At that time we began conducting company/industry research for our presentation at the conference in March.

Our team will present our findings to a panel of judges in the case study competition and compete against 10-14 other colleges/universities. The SAM conference will also include many other seminars and speakers on management topics of a great variety. For more in-depth details, please feel free to go to www.samnational.org.

Political Science

Schedule

10:00 - 11:30 AM
Simms 310
Kurt Baldwin, Brandon Brist, Madeline Carey, Ian Cochran, Peter Diliberti, Diana Elhard, Zachary Fraasch, Jacob Glynn, Sophi Gorman, Hannah Houts, Benjamin Hutterer, Sachal Jacob, Cody Jacobson Hanson, Aaron King, Philip Kittock, Rachel Koehler, Richard Podvin, Maxfield Rotert, Paul Rymanowski, Robin Swingley, Emily Thornton, Kathrine Tillman, Kirby Wagner, Peggy Yang (Christi Siver, Political Science) U.S Foreign Policy
- National Security Strategy Presentation

Abstracts

Baldwin, Brist, Carey, Cochran, Diliberti, Elhard, Fraasch, Glynn, Gorman, Houts, Hutterer, Jacob, Jacobson Hanson, King, Kittock, Koehler, Podvin, Rotert, Rymanowski, Swingley, Thornton, Tillman, Wagner, Yang: As the nation’s commander in chief and primary foreign policymaker, the President each year is charged with releasing a National Security Strategy that articulates “the worldwide interests, goals, and objectives of the United States.” Unfortunately, Presidents have rarely met this obligation on a regular basis. This year, the twenty-two students in Prof. Siver’s U.S. foreign policy class split into four issue areas (Power, Peace, Prosperity and Principles) to draft their own version of the National Security Strategy.
Psychology

Schedule

9:00 - 9:30 AM
NewSc 140  Amanda M. Munsterteiger (Abraham Immelman, Psychology) Hardiness: The Key to a Well-Adjusted College Experience

9:00 - 9:30 AM
NewSc 146  Daniel R. Green (Michael Livingston, Benjamin Faber, Psychology) Truth in Sight: The Effect of Physical Cues on Emotion

9:30 - 10:00 AM
NewSc 140  Katelyn Thoresen (Pamela Bacon, Psychology) Relational Self-Construal Moderates Relationship between Relational Success and Self-Esteem

9:30 - 10:00 AM
NewSc 146  Heather M. Grosso (Linda Tennison, Psychology) Evaluation of a Mindfulness Intervention for College Students

10:00 - 10:30 AM
NewSc 146  Addison J. Novak (Lisa Platt, Psychology) Examining the Factors That Influence an Individual’s Perception of Sexual Orientation Microaggressions

10:30 - 11:00 AM
NewSc 140  Kayla Bolland (Lisa Platt, Psychology) The Differences in Self-Esteem, Family Functioning, Parenting Styles, and Conscientiousness Between Hmong and Caucasian Individuals

Abstracts

Munsterteiger: Hardiness is a personal attribute commonly sought out in the workplace and is greatly valued in students of all ages. This study examined hardiness in relation to stress, happiness, and gender. Ninety undergraduate students from two colleges in the Upper Midwest completed previously established surveys on these constructs. It was hypothesized that hardiness would be negatively correlated with stress and positively correlated with happiness. It was also
hypothesized that females would report higher hardiness scores than males. The first two hypotheses regarding stress and happiness were tested with bivariate correlations and yielded significant results ($p < .01$). These results were consistent with findings reported in previous research. The third hypothesis was tested by means of an independent t-test, which found a significant difference in the opposite direction as the hypothesis, that is, males are harder than females. Few previous studies have been done on the relationship between gender and hardiness. Limitations in the study hinder its external validity.

**Green:** This study explored whether an actor taking a physical pose, normally associated with a specific emotion, affected the emotional state of the actor and whether this state was observable and could be transferred to the observer in an empathic fashion. This study consisted of 53 students from CSB/SJU obtained through convenience sampling. The study observed dyads of the participants who alternated in the roles of an actor, who took on a posture normally associated with an emotion, and an observer, who watched the pose taken by the actor. The actors covered their faces with a neutral mask, and the observers were told the purpose of the study was to rate the actors on their successful concentration on the pose taken. Surveys were distributed before and after the postures to assess the change in emotion of both members of each dyad. Acting sadness revealed a significant difference in emotional change among women, observing confidence revealed a significant difference in emotional change among men, and the identification of emotion revealed a significant result among all participants.

**Thoresen:** The relational self-construal is the extent to which individuals define themselves in terms of their relationships with close others. This study examines the role of the relational self-construal in the Sociometer Theory, which claims that self-esteem is the output from relational acceptance or rejection. I hypothesized that (1) the relationship between loneliness and self-esteem will be moderated by the relational self-construal, and (2) the relationship between the quality of relationships and self-esteem will be moderated by the relational self-construal. There was a significant negative correlation between loneliness and self-esteem. The researchers also found that for women, but not men, the relational self-construal moderates the relationship between the quality of relationships and self-esteem. So, for women who are high relationals, the quality of relationships is positively related to self-esteem, whereas for low relationals, there is no relationship between the quality of relationships and self-esteem. This study suggests that gender differences play a role in the relationship between the quality of relationships, relational self-construal, and self-esteem.

**Grosso:** The purpose of this study is to assess the effects of Mindful Awareness Training for Students (MATS), a mindfulness-based intervention integrated within
a college course and delivered primarily online. This seven-week program emphasizes the development of mindfulness, stress management, communication skills, compassion, and gratitude. Fifty-four students ages 18-23 participated in this study, with 28 in the experimental group and 26 in the assessment-only control group. Pre- and post-intervention surveys assessed students' wellbeing and adaptation to college. Analyses reveal no significant effect of the intervention, however approximately 56% of students rated its value as above average. The pre-intervention survey indicates that mindfulness is positively correlated with self-compassion, self-efficacy, self-regulation, gratitude, academic adjustment, and semester GPA. Mindfulness is negatively correlated with stress, anxiety, and negative affect. MATS was designed to offer students a mindfulness-based program with greater flexibility and reduced time and cost. Results suggest that, with modifications, MATS may benefit students. This study will contribute to our understanding of mindfulness-based interventions.

Novak: In the last century alone, the United States has made significant progress in the realm of social equality. While overt discrimination, such as racial slurs, are no longer appropriate in many situations, prejudice is still very present in our society even if it is not recognized by many as being harmful. A new, subtle form of discrimination called microaggressions has arisen. Although microaggressions are often unintentional, their effect is extensive and can cause those who are victims to have poorer quality of life. This research focuses on sexual orientation microaggressions and factors that impact an individual's ability to identify these microaggressions as discriminatory. The specific factors examined in this study are religiosity, empathy, gender, and attitudes towards lesbians and gay men. The information gained can be used to more easily plan and create useful interventions in schools and workplaces to increase awareness and decrease the frequency of microaggressions.

Bolland: The current study sought to reveal relationships between self-esteem, conscientiousness, perceived parenting styles, and family functioning among Hmong (N = 42) and Caucasian (N = 45) populations. A convenience sample of undergraduate college students participated in an online survey. Utilized measures included the Rosenberg Self-Esteem Scale, the Family Assessment Device, the Parental Authority Questionnaire (short version), the International Personality Item Pool Conscientiousness Scale, and a demographic questionnaire. The results revealed no significant difference in self-esteem or general familial stress between Hmong and Caucasian individuals, but Caucasian individuals were found to be more conscientious and have more familial role stress. There was no significant difference revealed in perceived authoritarian parenting styles between these two groups, but exploratory analysis revealed Hmong mothers to be both significantly more authoritarian and permissive than Caucasian mothers. The implication of
these results are considered and offer a deeper understanding of Hmong and Caucasian individuals, especially in relation to their families.

**Sociology**

**Schedule**

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<td>10:30 - 10:50 AM</td>
<td>Simms 360</td>
<td>Eric Reichert (Sheila Nelson, Sociology) An Organizational Case Study: Wolters Kluwer</td>
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<tr>
<td>10:30 - 10:45 AM</td>
<td>Simms 360</td>
<td>Erin K. O’Neil (James Makepeace, Sociology) “Come a Ridin’”: A Case Study Toward an Etic Perspective on Ranch Rodeo</td>
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<tr>
<td>11:10 - 11:30 AM</td>
<td>Simms 360</td>
<td>Mao Vue (Sheila Nelson, Sociology) What is happening to our Minnesotan Seniors?</td>
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**Abstracts**

**Reichert:** Wolters Kluwer Financial Services is an international corporation that specializes in risk management. This case study looks at the St. Cloud branch of this company headquartered in Amsterdam Netherlands. Through interviews with key leaders in the St. Cloud office, I explored the organizational structure and culture. In this presentation I will share my findings, focusing on the organizational strengths and challenges facing this local business.

**O’Neil:** This presentation describes an ethnographic and theoretical approach to Ranch Rodeo competition, a sport rural in nature, which implements horsemanship skills of traditional cattle ranching. The research explores social interactions within the sport through participant and nonparticipant observation, as well as interviews with various participants. The emergent results include a differentiation of characters and character types among participants, an ethnography of Ranch Rodeo structures and processes, and a theoretical analysis of Ranch Rodeo social integration and social structures. Durkheim’s mechanical variant of social solidarity is posited as the principle force of community cohesion, with love of horsemanship and a
presumption of livestock ranching as a moral foundation of western life as the uniformly shared values. Both the formal and informal Weberian sectors were posited as producing the generated and legated definition of the situation, but with charisma and informal expression prevailing due to a preponderance of euphoric elements and surfeit of formal authority.

O’Neil: This presentation will share the results of qualitative research with equine veterinarians and horse owners. This is an exploratory study investigating emotional work in veterinarians. The study also serves to identify and evaluate any gender and experience level preferences horse owners have toward veterinarians. Data was gathered through interviews with several veterinarians and horse owners, as well as a brief preliminary survey completed by roughly one hundred horse owners. Based on the unique relationship between owners and horses, I hypothesized that horse owners will prefer veterinarians that possess characteristics indicative of emotional care. Similarly, the association of emotional work with women will result in some degree of preference for female veterinarians. I also hypothesized a slight bias against veterinarians both new to the practice and against those who have been in practice for more than 15 years. Come to hear what I actually learned!

Vue: In this presentation you will be introduced to Arlington Place, an assisted living facility for seniors in our very own St. Joseph Community. While much attention has been focused on the well-being of the younger generation, for example, Governor Dayton’s recent budget proposal, the needs of the older generation are often invisible or ignored. The aging of the baby boomers is creating a rising demand for services—and soon one quarter of Minnesota’s population will be over 65. Arlington Place serves as a positive example of community living for Seniors. Come to learn about the programs, services, and quality of care being provided to our elderly neighbors.
Interdisciplinary Presentations:

Center for Global Education

Schedule

8:30 - 9:30 AM
Goree Fireside
Joseph L. Earney (Dianne Johnstone, Center for Global Education) Making Batcave Excursions a Reality: Dominican Republic Internship

Abstracts

Earney: If I had just one word to describe my International Internship with the Center for Global Education it would be “diversity.” My previous summer was spent interning with the service-orientated community organization Fundación Mahatma Gandhi in the northern town of Las Terrenas, Dominican Republic. During my internship I assisted in a wide array of projects that demanded a well-rounded skill set. I facilitated summer camps for elementary-aged children that incorporated education in two of my own personal interests music theory and proper hygiene practices. I helped with maintenance and upkeep at the Fundación Mahatma Gandhi facility. I was even afforded the opportunity to shadow local physicians in the E.R. during the country’s chikungunya outbreak. However, while all of these experiences were instrumental to my internship, without a doubt what I am most thankful for from my internship was my time working with la batcueva - the batcave.

Located just a short motoconcho (a D.R. motorcycle taxi) ride south from Las Terrenas lies the isolated community of El Jamito - the town that would become my family during my time in the D.R. Life in El Jamito was simple. One church. One colmena. One secluded lifestyle. There was something innately delightful in knowing that here was a tiny crack in the world where it appeared time had forgotten and fallen through. Only a few homes had running water as the government had essentially cut off their water supply, and if you desired a snack all that was required was to find one of the many mango trees scattered around the hillside. The 200 or so inhabitants of the town could not have shown us interns more hospitality whenever we would visit their community for a summer camp or other endeavors. On one morning during our homestay in El Jamito a local community leader took us, much to my elation, to a fairly large cave located ten minutes away from town by slogging through the thick wet underbrush. It is of note that I have - how do I put this - “an intrinsic obsession” with caves. I. Love. Caves. I don’t know what started the fascination. Perhaps our annual family vacation to Branson, Missouri where it would always be on the agenda to visit at least one cave in the area had a role in it. We entered the cave, and I was immediately blown away!
It was fantastic, complete with abundant stalactites, quartz formations, winding passages, vaulted ceilings, and most importantly bats! This cave had boundless potential, and El Jamito needed to know this. Join me for my presentation on how I ultimately pitched the idea for sustainable batcave excursions that could benefit the remote village of El Jamito.

First Year Seminar (FYS)

Schedule

9:30 - 10:30 AM
CLEML Creative Media Lab
Mark Hanowski, Benjamin Klaphake (Mary Jane Berger, First Year Seminar (FYS)) The Benedictine Values: A Community in Action

Abstracts

Hanowski, Klaphake: We feel these Values, given to us by St. Benedict, provide a model and guide to living a holy, spiritual, and productive community-based life. This five minute video features interviews and mock-interactions of some of the people part of this Benedictine Community.

Institute for Women’s Leadership

Schedule

10:30 - 11:30 AM
Gorec 204 C

Abstracts

Fischbach, Hueg, Rudnickas, Pinder, Salto, Pham, Pioske, Kangas, Mueller, Andrews, Rhude, Rainey, Campbell-Vargas, Myers, Heller, Berry: The Hynes Scholars, under the supervision of Psychology professor, Janet Tilstra, conducted a research study to explore CSB and SJU students’ beliefs and practices related to a range of life topics, including perceptions of gender. The purpose of the study was
to identify whether beliefs and present/future actions differed among students who
self-identified as feminists, non-feminists, or non-labelers (agree with some feminist
ideals, but don't label themselves as feminists). The project was completed using
CSB and SJU student responses to an online survey based on the Feminist Identity
Composite. Results were analyzed by campus affiliation and self-identification label.
Better understanding of feminist self-identification, core beliefs, and actions will
inform understanding of students' identity development with regards to gender.

Media Services

Schedule

11:00 - 12:00 PM
CLEML A129  Erin Stout, Tyler Meyer (Adam Konczewski, Media
Services) 3D Printing and Sketch-Up Design

Abstracts

Stout, Meyer: Students will present how they have used Sketch Up and 3D printing
both in the designing of 3D models for coursework and in the creation of their own
ideas beyond the classroom, from producing a functional phone case through 3D
printing to the development of architecture design with Sketch Up. Sketch Up has
been used for a variety of courses within disciplines such as Environmental Studies,
Art, Computer Science, Physics and Biology. Presenters will provide a
demonstration of how the 3D printer prints and finishes products. They will also
give a brief tutorial on how students from all majors can take advantage of these
programs through CSB/SJU Media Services.

Sustainability

Schedule

10:30 - 4:30 PM
Goree 204B  Suzanna L. Adams, Alec G. Almquist, Kayla E.
Brattensborg, Samuel J. Broback, Marisol Castillo, Molly
E. Cullen, Megan N. Dobberstein, Molly K. Evavold,
Kennedy H. Hageness, Savannah J. Hilback, Katherine A.
Hohmann, Olivia G. Irwin, Jane C. Keohen, Rachel J.
Kiley, Komani Lee, Ellen S. Marvin, Mone'kai K.
Shannon-Thornton, Dana N. Straton, Brooke A. Stier
(Jeffrey Kaster, Sustainability) Festival of Faith

Abstracts
Adams, Almquist, Brattensborg, Broback, Castillo, Cullen, Dobberstein, Evavold, Hageness, Hilback, Hohmann, Irwin, Keohen, Kiley, Lee, Marvin, Shannon-Thornton, Straton, Stier: Students in the THEO 381 Youth Ministry class have prepared faith-sharing talks seeking to both share their personal connection with God and encourage faith growth in others. Students have previously given these talks to high school youth in local congregations. These have proved to be so inspiring that the class (or at least the instructor) wants the students to share their talks with the wider CSB/SJU community.
Music
Kyle Lamb, Michael Benson, Nicholas Benson, Timothy Fitzgerald, MacKenzie Flickinger, Matthew Jakubisin, Elizabeth Larson, Jonathan Larson, Allison Meinecke, Ramond Mitchell, Paul Nasvik, Jamie Reynolds, Elizabeth Ringle, Gracelyn Rymanowski, Erin Takle (Brian Campbell, Music) Flock: Choral Composition and the Poetry of Billy Collins

This session begins with the world premiere of “Flock” - a choral composition by Kyle Lamb with text by two-term poet laureate Billy Collins. The composer will then lead a brief discussion on Collins' poetry and the composition methods utilized to set his text effectively. Following this, the composer and performers host a quick Q & A session on the overall composition and rehearsal process. The session concludes with a repeat performance of “Flock” to showcase what was discussed through the presentation.

Allysa Larson, Catherine Pettinger (Brian Campbell, Music) The CSB/SJU Viola da Gamba Consort

The College of Saint Benedict and Saint John’s University is one of the few schools in Minnesota to be fortunate enough to have a Viola da Gamba Consort. Viols are bowed string instruments that preceded the violin family of instruments. This presentation will discuss the history of the viol, compare the viol to modern string instruments, and demonstrate how to play the instrument. There will be a short performance by the current Viola da Gamba Consort.

Henrita Academic Building 009, CSB

First Year Seminar (FYS)
George Dornbach (Kathleen Costello, First Year Seminar (FYS)) John Doman - People of the Pines

30 seconds. That's all it takes for John Doman, or JD to friends and students, the Link Bus Driver and trivia master extraordinaire to capture the attention of 60 some sleep deprived, caffeine infused, stressed out students riding his bus. 30 seconds is all it takes to turn around your crummy morning. Imagine, however, if we spent more than just those 30 seconds, and took time to listen to JD’s words away from the scratching and sometimes intermittent bus PA system.
I bet you’d learn a lot.

This short video documentary series, People of the Pines intends to give a voice to those in our community who we may interact with on a daily basis but often times know little about as people. To showcase and celebrate the depth, diversity, and knowledge that lives within our CSB/SJU community.

Art Building 102, SJU

Art
Timothy M. Carlin, Anthony D. Eskew, Mengyang Makori, Matthew D. Morsette, Jordyn O. Potter, Daisy Solis, Heran G. Tebeka, Shuting Zhang (Simon-Hoa Phan, Art) Film Presentations

Film Presentations

Art Building Art 102, SJU

Art
Kate E. Minnich (Rachel Melis, Art) Evolution of Medieval Traditions in Book Design

The focus of this presentation is work I have completed as part of an internship at the Hill Museum and Manuscript Library on the medieval methods of book design that have been carried through the ages by Arts & Crafts designers William Morris, Eric Gill and Rockwell Kent. In the year 1848 the precursors to the Arts & Crafts Movement founded the Pre-Raphaelites with the purpose of promoting realism and reviving medievalism. The founding members, Holman Hunt, J.E. Millais, Dante Gabriel Rossetti, Madox Brown, and John Ruskin, were discontented with the lack of realism displayed by Michelangelo and Raphael to such an end that they promoted the style of art completed before the time of the two art behemoths. The Pre-Raphaelite Brotherhood only lasted seven years but similar ideals of medievalism, and technique were reformed with the creation of the International Arts and Crafts movement in 1880. The movement focused on the design and technique put into a work of art rather than the speed and cost efficiency of the project. The survival of medievalism within book design can be attributed to the Pre-Raphaelites and the Arts and Crafts movement. Each movement had a group of artists who recognized the beauty of the illuminated manuscripts and modified the methods for their own art. The painters in the Brotherhood imitated the
use of bold colors and composition layout. The Arts and Crafts movement inspired artists to design fine press books in the style of the medieval manuscripts.

*Art Building Rogers/Target Galleries, SJU*

**Art**

Christina M. Angell, Kathryn E. Beumer, Jessica J. Lindemyer, Megan C. McKeehan, Ana E. Nugent, Jessie F. Sorvaag, Katlyn M. Sovada, Katherine A. Walz, Weijue Wang, Chong Yang, Tianning Zhang (Simon-Hoa Phan, Art) Senior Art Majors

Senior Art Majors

*Great Hall, SJU*

**Biology**

Tyler J. Bruinsma, Jared M. Grootwassink, Kevin T. Curwick, Thomas M. O’Toole, Leah M. Ellman (Katherine Smith, Biology) HLHS is caused by the up regulation of HIF1α due to hypoxia caused by a polymorphism in eNOS

The G894T polymorphism in eNOS during early stages of embryonic cardiogenesis results in a reduction of basal NO production, which results in vasoconstriction and prevention of HIF1α degradation. As a result, prolonged hypoxia in the developing heart brings about an accumulation of HIF1α. When combined with environmental factors such as inflammation and depleted levels of NO, the increased levels of HIF1α down regulate TBX5, NKK2.5, and MEF2C; genes responsible for development of the left ventricle. Compounded with data demonstrating that degradation of eNOS results in uncontrolled cardiomyocyte apoptosis, the greater expression of HIF1α results in an underdeveloped left ventricle corresponding to HLHS. Simple parental PCR testing for the G894T polymorphism in eNOS and ELISA assay for observing abnormal levels of HIF1α in iPSCs from HLHS patients can determine the accuracy of our proposed mechanism. A proposed treatment regimen calls for ACE inhibitors or statins to promote eNOS activation, leading to greater prevalence of NO, which eliminates one factor contributing to HIF1α abundance.

Ryan Buron, Elise Reid, Maria Friedges (Stephen Saupe, Biology) COMPARISON OF RATES AND PERCENT RECOVERY OF PHOTOSYNTHESIS BETWEEN C3 AND C4 PLANTS
When plants are placed in the dark the stoma close and this results in a significant decrease in CO₂ uptake for photosynthesis. We propose that C₄ plants such as maize (Zea mays) will have a higher rate of photosynthesis and recover from a dark-treatment more rapidly than a C₃ plant such as common bean (Phaseolus vulgaris). We acclimatized plants to the dark for 27 hours. Using a LICOR6400 we measured the dark respiration rates and then measured photosynthetic rates during two, 90-second bursts of light. Results will be presented.

Abigail F. Bushey, Kenea M. Andrews, Joseph L. Earney, James T. Pathoulas (David Mitchell, Biology) HLHS is caused by the combined adverse effects of two polycomb/trithorax related faulty pathways

Our group participated in the Mayo IMPACT program and researched the underlying cause of Hypoplastic Left Heart Syndrome. We presented our research to other participants from Colleges in Minnesota, physicians, and other members of the Mayo Clinic. The program is sponsored by Mayo Clinic’s Todd and Karen Wanek Family Program for Hypoplastic Left Heart Syndrome, Center for Regenerative Medicine, and Office for Applied Scholarship and Education Science

Ian DeVaan, Brandon Morine (Stephen Saupe, Biology) Determination of the Effects of Acid Rain on the Rate of Photosynthesis of Helianthus annuus

We will investigate the effect of acid rain on the rate of photosynthesis of the common sunflower. We hypothesize that there will be a measurable decrease in the rate of photosynthesis when a plant has been exposed to acidic water. Photosynthetic rates in control and acid-treated (acidified water, pH 3) were measured with a LiCOR6400. The results and significance of this study will be presented.

Nicholas M. Devetter (Jennifer Schaefer, Biology) Optogenetic manipulation of Drosophila larval motor circuits

We used optogenetic techniques to control specific interneuron populations in order to assess their contribution to muscle cell contraction in the Drosophila larva model. Little is known about the specific neural circuits controlling these muscle contractions so this research was designed to further our knowledge about the composition of the motor circuits.
Benjamin J. Hillesheim (David Brown, Biology) Stratigraphic Interpretation of a Permian Limestone from Glass Mountains, West Texas

Because of their incidence across geological time, prevalence of organisms that form fossils, (laminated or patterned sediments, shells, or skeletons, etc.), and favorable preservation environments, marine fossil reefs can record both small- and large-scale geological and paleontological events. In particular, the taphonomy of reef invertebrates can evince local geological context and ecological events. The Delaware Basin was a reef-forming system in what is now West Texas and New Mexico during the Permian Period (between 265 and 272 million years ago). I had access to a small section of rock collected from the Glass Mountains (West Texas), which was associated with a reef complex in the southeastern part of the Delaware Basin. I studied the carbonate matrix and the diversity of fossils and their orientations in this sample to determine whether they were consistent with being deposited in a fore-reef, back-reef, or deltaic environment. My observations suggested that this sequence from the Glass Mountains was deposited in a deltaic environment.

Emily Hodorff, Micayla Westendorf, Siri Berg-Moberg (Kristina Timmerman, Biology) The Effect of Water Depth on Sea Urchin Abundance and Variety of Species in La Lobería Bay

Sea Urchins are important players in marine ecosystems. They consume algae and kelp and in turn become food for larger marine predators. They play a role in the balance of their aquatic ecosystems; the absence or abundance of sea urchins can lead to the demise of a marine community. Our research goal was to determine the effect of water depth on the population density of two species of sea urchins found in La Lobería Bay, San Cristóbal, Galapagos Islands, as well as the distribution of the species of urchins present in that area. We sampled 45 cm x 45 cm areas at random depths over the course of nine days (n= 45) to obtain our data for analysis. It was determined that water depth did impact the species present and the depth of the water does play a significant role in the number of sea urchins found and the type of sea urchins found in each sampled location. These findings were surprising as sea urchins are able to survive in a variety of depths and temperature conditions (Bond 2008).

Kathryn N. Keller-Miller, Asha D. Kopp, Tanner B. Rayman (Stephen Sause, Biology) INFLUENCE OF TEMPATURE ON PHOTOSYNTHETIC RATES IN C3, C4, AND CAM PLANTS
The rate of photosynthesis is vital to plant growth and development. Using the LiCor 6400, the photosynthetic rate of five plants was measured. The plants measured were C3 (Black Turtle Beans, Grand Rapids Lettuce, and Pickling Cucumbers), C4 (sweet corn), and CAM (succulent) plants. The temperature was varied between 5°C Celsius above ambient, at ambient, and 5°C below ambient. For each plant, five measurements of the photosynthetic rate were taken at each targeted temperature. The results are forthcoming. These results help explore the relationship between C3, C4, and CAM plants and their native climates.

Emily Kiolbasa, Toni Gohman (David Brown, Biology) Analysis of sediment reveals an ecological “regime change” in Lake Hilary

The characteristics of lake sediments and the fossils interred therein provide excellent records of environmental change. In particular, the sediment’s density and proportions of organic matter and carbonates can help infer features such as lake depth, productivity, and occurrences of low water levels. We estimated these sediment characteristics at approximately 5 cm intervals along a 15.75 m core from Lake Hilary in the Saint John’s Abbey Arboretum. We heated 2.5 ml sediment samples from each depth to 105°C, 500°C, and 900°C, and determined their masses after each temperature to estimate density, organic fraction, and carbonate fraction respectively. Sediment density declined rapidly from 0.8g/ml at 15.75 m to 0.4 g/ml at 15 m, slowly to 0.2 g/ml at 6.5 m, then dropped abruptly to 0.1 g/ml for the remainder of the core. The organic matter and carbonate contents, which had both risen from < 10% of sediment mass at 15.75 m to about 30% of sediment mass at 6.5 m, diverged abruptly at 6.5 m. We interpreted this “regime change” as a transition from a lake dominated by open-water processes to one dominated by processes associated with extensive shoreline wetlands and littoral zones. Curiously, the fossil pollen record from Lake Hilary does not evince a major vegetative reorganization at the same depth as that of the lake itself, suggesting that the successional trajectories of Lake Hilary and its surrounding vegetation may be somewhat independent and exhibit different ecological tipping points.

Nathan Ley, Robert Thomas (Barbara May, Biology) Comparison of Bacterial Flora in Fish Slime and Lake Water

Although commonly known for their ability to cause deadly infectious diseases, there are populations of bacteria (identified as normal flora) that symbiotically live on and amongst larger host organisms and positively impact survival of the host. In previous research, culturing methods suggest
that freshwater fish (i.e. bluegill and northern pike) maintain a normal flora population and that this flora aids in protection and the health of the fish (2,3). Cultures were sampled from fish skin, gut, and gills within individual species to identify their general populations to further speculate on the role of normal flora in the fish. Notably, one particular study on skin mucus suggested that the bacteria housed in the mucus are not maintained by the fish environment, but rather transiently acquired from the lake water (1).

Based on this previous data, our study proceeded with the consideration of a few particular questions:

Does the bacterial roster differ between the fish and the environment (lake water)?
Does the bacterial roster differ between species of fish within the same lake?
Does the bacterial roster from the same species differ between different lakes?

To do so, our study used modern pyrosequencing techniques to identify a larger, more complete population of normal flora in 2 different lake samples from various different fish samples (Table 1). Identifying and comparing the normal flora populations in the lakes and different fish species would provide us with an better understanding of a fish's interactions with normal bacterial flora.

Nathan Ley, Michael Culshaw-Maurer, Vincent Lamovec (Stephen Saupe, Biology) INVESTIGATION ON THE CONTRIBUTION OF CHEMICAL IRON TO PHOTOSYNTHESIS IN LENTILS

The purpose of this investigation was to identify the role played by chemical iron (Fe) in the photosynthetic process in lentils. Fe is an important electron acceptor involved in multiple sites in non-cyclic photophosphorylation including cytochromes and several electron carriers in Photosystem I. We hypothesized that photosynthetic rates of Fe-deprived plants are lower than that of control plants. Photosynthetic rates were measured with a LiCOR6400. Results will be presented.

Paul E. Lundberg (Stephen Saupe, Biology) INFLUENCE OF CLIMATIC AND NON-CLIMATIC VARIABLES ON ACER SACCHARUM SAP CONTENT

The mechanism by which maple sap flow occurs in the spring is not known with certainty. The aim of this study was to determine the effect of climate and non-climatic variables on the sugar content and flow rate of sap
produced by Sugar maple trees. Trees in the Saint John’s Arboretum were
tapped and the sap yield, sap sugar content and sap pH were measured.
These values were then analyzed to see if any correlation existed between
them and temperature. Results will be presented.

Katee Meckeler, Elise Reid (Stephen Saupe, Biology) Preliminary Research on the
Effects Freezing has on Sugar Concentrations of Artificial Sap

Premise and Aims: The purpose of this experiment was to measure the
sugar concentration of frozen artificial maple sap and the remaining
unfrozen sap to determine if it is economical to discard the frozen sap or if
this would result in a loss of syrup.

Methods: Fourteen liters of a 2% sucrose solution, “sap”, was frozen until
roughly 20% of the sap froze. The unfrozen sap’s volume and sugar
concentration were measured and recorded. The frozen sap was allowed to
melt and the volume and sugar concentration were measured.

Results: The concentration of the sugar in the frozen sap reached 1.5-2.0%
sugar concentrations at which point up to 23% of the syrup may be lost on
a small scale experiment such as this one.

Conclusion: This suggests that it may be more economical to save the
frozen sap rather than discarding it to minimize syrup loss.

Ryan M. O’Gara (Clark Cotton, Biology) Kidney Function Of Ictidomys
tridecemlineatus During Diuresis and Antidiuresis

During bouts of torpor hibernating animals have greatly reduced metabolic
rates leading to profound decreases in body temperature and blood
pressure. As a result of these conditions, kidney filtration and the ability to
concentrate urine cease. Once a week, however, hibernators rewarm to
euthermic body temperatures and regain kidney function. This is
associated with rapid changes in extracellular osmotic gradients within the
kidney, a remarkable feat but one that is potentially damaging to kidney
cells. While hibernators deal with this stress by up-regulating expression of
heat shock proteins (HSP’s) and protective organic osmolytes, little research
has been done to see if hibernating animals can achieve and cope with
similar situations during the summer. To address this question we placed a
typical hibernator (I. tridecemlineatus) on various water intake regimes over
the summer to experimentally manipulate vertical osmotic gradients in the
kidney. We then measured renal expression of HSP 70 in response to
changes in the vertical gradient. Animals rapidly altered the vertical gradients in their kidneys in response to different water intake regimes. This was accompanied by large changes in urine volume and concentration, and maintenance of serum hydromineral homeostasis. Unlike hibernation however, HSP70 expression was up-regulated in response to loss, rather than gain, of vertical osmotic gradients. This difference may be due to an interplay between HSP70 and protective organic osmolytes. Future studies will examine this relationship in closer detail and also evaluate the response of non-hibernating species to similar conditions.

Connor Piechota, Kevin Watson, Ryan Fuxa (Kristina Timmerman, Biology)
Galapagos Sea Lion Behavioral Differences in Relation to Human Exposure

Our study examined the behavioral differences of the Galápagos sea lion (Zalophus wollebaeki) in relation to human presence. Our main goal was to determine whether sea lions would be more aggressive as a result of high frequencies of human exposure. We hypothesized that sea lions would behave differently in relation to varying rates of human exposure and we predicted that there would be more aggressive and interactive behaviors on beaches with higher frequencies of human exposure (as the humans may disturb the normal behavioral patterns of the sea lions). Data was collected daily at low tide in two-hour intervals. Our study took place during July 2014 on Isla San Cristóbal on three beaches near Puerto Baquerizo Moreno, Galápagos Islands, Ecuador. We recorded the number of people and sea lions on each beach during each data collection, as well as any observed behavioral characteristics of sea lions. We categorized behavioral characteristics of sea lions as aggressive, interactive but non-aggressive, and non-interactive both on terrestrial and aquatic environments. In addition, we accounted for the frequency of interactions in relation to the size of the beach in which data was collected. Results from a Chi-squared goodness of fit test showed that there was a significant difference in the sea lions’ behavior in relation to human exposure (p < 0.0001). Further analysis showed that sea lions tend to be more aggressive in response to higher frequencies of human exposure (p < 0.0001). Previous studies have shown that high rates of human exposure in sea lion habitats can result in a decrease of sea lion populations (French et al., 2011). With regards to these results, there should be a consideration for how human exposure can affect the behavior of sea lions. Tourism in the Galápagos Islands remains prevalent, which can potentially disrupt the natural behavior of protected species if humans disrupt the animals’ natural behavior.
The Galápagos Islands have several distinct ecosystems that rely on keystone species to maintain their balance. An example of this is the marine ecosystem in which the White-Tailed Damselfish (Stegastes leucorinus boco) and Yellow-Tailed Damselfish (Stegastes arcifrons) reside. This study focused on the relationship between the White- and Yellow-Tailed Damselfish and algae species, at Playa Mann, Isla San Cristóbal, Galapágos Islands, Ecuador, as a continuation of a study completed in July 2013 at La Lobería, Isla San Cristóbal, Galápagos Islands, Ecuador. The data collection took place during the periods of low tide, ranging from 8:30 AM - 1:30 PM, from July 12 through July 17, 2014, in attempts to maintain consistent water depths. It was decided that Playa Mann would be observed as one area. There were fifteen data points collected within Damselfish territories and fifteen corresponding data points outside of Damselfish territories. The data points were collected between ten and thirty meters from the shoreline. Each data point was collected five meters apart from the previous point, with the direction being chosen randomly. A data point was collected using a 50 by 50 cm PVC pipe square “quad,” which was placed on the ocean floor in the center of the damselfish territory or the damselfish-free area. The water depth and surface temperature were recorded with a Hawk Eye Digital Sonar 122PX Handheld Sonar System. A picture of the quad was then taken, and the pictures were later analyzed to count the different species of algae present within the quad and to determine the percentage covered by the algal species. According to the data, there was no significant difference ($p = 0.557$) between number of algae species present in the plots where the damselfish were present versus the plots where the damselfish were not present. There was a very significant difference ($p = 0.000052$) between the percent of algae coverage in the plots where the damselfish were present and the plots where the damselfish were not present. According to this data, the presence of White- and Yellow-Tailed Damselfish in an area leads to a large increase in algal biodiversity, but not significantly. It was also concluded that the presence of damselfish creates a significant difference in the algal coverage than areas without damselfish. Thus, damselfish are a valuable keystone species within their environment. The farming of algal species done by the damselfish assists in removing algal species that tend to overpopulate an area, which then allows for other species of algae to grow and create a more complex ecosystem. Without the important variation in algal species, it is possible for the algal diversity to become almost completely lost; this is why the role of damselfish is critical within their ecosystem.
Hypoplastic left heart syndrome (HLHS) collectively refers to a range of congenital heart defects, all involving some degree of left ventricular hypoplasia, or underdevelopment of the left ventricle. Additionally, HLHS often involves coarctation of the aorta, and can also include hypoplasia of the ascending aorta, as well as mitral and/or aortic valve stenosis or atresia. HLHS is extremely rare, as it has been reported to occur in only 1 in 5000 live births each year. The cause of HLHS is currently unknown, however there is strong evidence for both genetic and environmental factors. Studies have shown that HLHS births spike in June, indicating that seasonally-based environment factors, in particular, may be involved in causing HLHS. Based on this, we propose that HLHS is due to ingestion of pseudoephedrine (aka Sudafed,) a common over-the-counter decongestant, during the crucial heart development window during pregnancy. Pseudoephedrine, and similar seasonal medications, have the potential to cross the placental barrier and activate a PKC-mediated signaling cascade which results in changes in expression of the Tbx gene family, eventually leading to abnormalities in left heart development and HLHS. The Tbx genes have already been identified as the cause for many other well-characterized genetic conditions involving congenital heart defects, including some diseases that have frequently been found to be associated with HLHS.

Elise V. Reid (Stephen Saupe, Biology) Preliminary Research on the Effects of Freezing on Sugar Concentrations of Artificial Maple Sap

Premise and Aims: The purpose of this experiment was to measure the sugar concentration of frozen artificial maple sap and the remaining unfrozen sap to determine if it is economical to discard the frozen sap or if this would result in a loss of syrup.

Methods: Fourteen liters of a 2% sucrose solution, “sap”, was frozen until roughly 20% of the sap froze. The unfrozen sap’s volume and sugar concentration were measured and recorded. The frozen sap was allowed to melt and the volume and sugar concentration were measured.
Results: The concentration of the sugar in the frozen sap reached 1.5-2.0% sugar concentrations at which point up to 23% of the syrup may be lost on a small scale experiment such as this one.

Conclusion: This suggests that it may be more economical to save the frozen sap rather than discarding it to minimize syrup loss.

Holly V. Spitzer (Barbara May, Biology) An Analysis of Bacterial Contamination of Chicken Eggs and the Development of Antimicrobial Resistance

Chicken eggs are a major component of American diets, with an average yearly consumption of approximately 250 eggs per person (according to estimates made by the American Humane Society). While highly nutritious, eggs are also one of the leading causes of food poisoning and food borne illness in the United States. Eggs may become contaminated by a number of different types of bacteria during production, including Salmonella, a group of bacteria that, according to the CDC, causes more than 1.2 million cases of food borne illness in the United States every year. In an effort to decrease the frequency of food contamination with bacteria like Salmonella, many food producers have begun to treat their livestock and poultry with antibiotics, both as a method of preventing and treating illness within the population. In some cases, antibiotics have even been used as growth-promotants. While this practice frequently improves the overall health and productivity of the flock, it also contributes to a phenomenon in which bacteria develop a resistance to antibiotics (Singer, Hofacre Avian Diseases). This phenomenon has been observed and studied with the emergence of methicillin-resistant Staphylococcus aureus (MRSA), a pathogen commonly affecting humans. According to the National Institute of Health, MRSA has developed as a result of bacterial adaptation and due to repeated administration of antibiotics. As antibiotics commonly used to treat S. aureus increase in the environment, those bacteria that are randomly resistant to antibiotics and, as a result, the frequency of bacterial resistance increases. As the use of antibiotics in egg production increases, antibiotic-resistant strains of Salmonella and other bacteria are likely to emerge, contributing to increased food borne illness and decreased ability to treat infections.

In an effort to develop a better understanding of egg contamination during production, this experiment utilized a variety of types of chicken eggs, including those from commercial producers and local, private producers. These types included eggs with a variety of labels, such as organic, vegetarian fed, free range, farm fresh, and antibiotic free eggs. Bacterial samples were cultured and isolated from the shell, albumen (egg
white), yolk, and outer shell membrane, and were identified using 16S DNA sequencing. In an effort to identify emerging bacterial resistance, the samples were tested for resistance (using the Kirby-Bauer method) to antibiotics and cleaners that are commonly used in egg production and are approved by the USDA for use on laying hens. It was hypothesized that differences in production (free range vs. caged, organic vs. non-organic, vegetarian fed vs. normal feed, etc.) may have some effect on the variety of bacterial contaminants and the areas of the egg they would be able to contaminate, but that the ultimate factor in contamination would be the washing technique used during production. Additionally, it was hypothesized that eggs that were more exposed to antimicrobials and antibiotics would exhibit more resistance. Finally, the experiment was expected to reveal trends in what types of bacteria are able to penetrate various membranes within the egg.

Mariah Valiant, Haley Charetaine (Stephen Saupe, Biology) Investigation of the effects of water stress on Vigna radiata and Brassica rapus

Water is to photosynthesis because it provides electrons for the light-dependent reactions. Therefore, we hypothesize that the photosynthetic rates in both the Vigna radiata (mung beans) and Brassica rapus (rutabagas) will decrease after withholding water until exhibition of water stress symptoms. Using a LICOR6400, photosynthetic rates for hydrated and desiccated plants were measured. The rutabaga leaves wilted faster than the mung bean leaves. Our results support our hypothesis because water-stress decreased the photosynthetic rate in both species. This experiment is significant because it gives us insight on the difference in water use efficiency between mung beans and rutabagas, as well as general effects of water stress on photosynthetic rates.

Kevin Watson, Connor Piechota, Ryan Fuxa (Kristina Timmerman, Biology) Galápagos Sea Lion Behavior Differences in Relation to Human Exposure

Our study examined the behavioral differences of the Galápagos sea lion (Zalophus wollebaeki) in relation to human presence. Our main goal was to determine whether sea lions would be more aggressive as a result of high frequencies of human exposure. We hypothesized that sea lions would behave differently in relation to varying rates of human exposure and we predicted that there would be more aggressive and interactive behaviors on beaches with higher frequencies of human exposure (as the humans may disturb the normal behavioral patterns of the sea lions). Data was collected daily at low tide in two-hour intervals. Our study took place during July
2014 on Isla San Cristóbal on three beaches near Puerto Baquerizo Moreno, Galápagos Islands, Ecuador. We recorded the number of people and sea lions on each beach during each data collection, as well as any observed behavioral characteristics of sea lions. We categorized behavioral characteristics of sea lions as aggressive, interactive but non-aggressive, and non-interactive both on terrestrial and aquatic environments. In addition, we accounted for the frequency of interactions in relation to the size of the beach in which data was collected. Results from a Chi-squared goodness of fit test showed that there was a significant difference in the sea lions’ behavior in relation to human exposure \( (p < 0.0001) \). Further analysis showed that sea lions tend to be more aggressive in response to higher frequencies of human exposure \( (p < 0.0001) \). Previous studies have shown that high rates of human exposure in sea lion habitats can result in a decrease of sea lion populations (French et al., 2011). With regards to these results, there should be a consideration for how human exposure can affect the behavior of sea lions. Tourism in the Galápagos Islands remains prevalent, which can potentially disrupt the natural behavior of protected species if humans disrupt the animals’ natural behavior.

Hispanic Studies

Austin J. Barkley (Nelsy Echavez-Solano, Hispanic Studies) La desigualdad de oportunidades en América Latina: el caso de México

This poster will present the inequality of opportunity in Latin America. Using Mexico as a case study, the presenter will discuss three main factors of inequality of opportunity: gender, race, and income. The poster will also explore the Mexican social policies that are currently working to reduce inequality of opportunity. Presentation in Spanish with discussion in English or Spanish.

Joseph Dingmann (Patricia Bolanos-Fabres, Hispanic Studies) Gender Quotas in a Latin American Context

Feminism has been a hot-button issue, and recently several different groups have been discussing what it actually means to be a feminist. This conversation has brought more focus and attention onto issues of gender inequality. One of the most prominent arenas of inequality is the political sphere, more specifically the disparity between the numbers of male and female representatives in legislative bodies around the world. At the end of 2014, only 25.7% of legislators worldwide were female, even though women make up roughly half of the world’s population. This number had grown from 12.7% in January 1997.
This paper studies the issue of gender inequality in legislative bodies by looking at electoral gender quotas. Quotas are an affirmative action program that looks to increase minority representation in legislatures. Quotas are becoming increasingly common across the globe. This paper asks the question of how do quotas affect societies as a whole by looking at two specific Latin American cases, Mexico and Argentina. This analysis will focus not only on how quotas have allowed women to enter into the political sphere, but more importantly what happens to institutions when more women enter legislatures.

David Frye (Patricia Bolanos-Fabres, Hispanic Studies) A Generation Lost in Spain: The Impacts of Economic Policy on Youth Unemployment

This essay investigates the impact of fiscal and monetary policies implemented by the Spain, since its induction into the European Union, on the unemployment rates of young people. This economic, theory-based analysis delves into the reality of the recession for Spain through the use of data and economic policies to determine what led to the rapid increase unemployment for young adults and the decrease in growth in the beginning of 2008. Finally, it will determine of the policies that were implemented in response to the recession were effective, and the effects it may have in the future of Spain's lost generation.

Thomas Ingebrigtsen (Patricia Bolanos-Fabres, Hispanic Studies) Homosexuality and Shared Marginalization: An Analysis of the Literature of Federico Garcia Lorca

The poetry and theatre of Federico García Lorca paint a vivid, entertaining, and often dark picture of life in 20th century Spain. The subjects of his works often face adversity as a result of social structure; he portrays women and gypsies—historically marginalized by the traditional patriarchal society during this time—who like homosexual individuals also faced strong discrimination by a very Catholic, heteronormative society. In the 1980's, unpublished manuscripts by Lorca were discovered and released, and his homosexuality was confirmed with certainty. This led some scholars to attribute his work entirely to his homosexuality. While Lorca's sexuality in context undeniably influenced his work, an investigation into his life and works demonstrate a personal connection to many marginalized persons in which he does not simply express his work as a product of his sexuality but rather a challenge to a society that did not value or accept diversity. The themes of silence, false identity, and death will be used to demonstrate marginalization in the works of Lorca with additional analysis and anecdotes from other scholars to support their greater context. This view of
Lorca’s work seeks an analysis of the works that is informed by Lorca’s sexuality rather than dominated by it, allowing each work to maintain its individual merits and themes.

Cassandra Jones (Patricia Bolanos-Fabres, Hispanic Studies) Impunity and the Press: The Case of Mexico

This analysis explores the freedom of press in Mexico between 1990 to the present and attempts to determine the extent to which corruption, intimidation and the collusion between government official and the drug trade has undermined this freedom. This paper will use testimonies, statistics, news articles and historical accounts to document the strengthening of the bond between government and the drug lords, and as a result journalists face extreme dangers in practice of their profession such as prison sentences due to the libel law, self-censorship from intimidation, kidnapping and murder. There have been some attempts to thwart these dangers through a new law and citizen journalism, though it is hard to measure their effectiveness. Finally, this analysis will compare and contrast Mexico’s press freedom with that of the United States and propose alternative solutions and ways of coping with this problem.

Jamia Moss (Patricia Bolanos-Fabres, Hispanic Studies) Mayan Activism in Post-Civil War Guatemala

This poster summarizes a Hispanic Studies capstone research paper. The research paper presents and develops the idea that post-war grassroots Mayan activism brought more lasting positive change to Guatemala after its 36-year civil war than governmental revision and political activism. Such positive changes include pro-Mayan education, recovery of Mayan traditions, and preservation of Mayan languages, for example.

Robert M. Pezan (Nelsy Echavez-Solano, Hispanic Studies) Inmigración latina y el racismo en los Estados Unidos

I hope to present my Hispanic Studies capstone project that I completed last semester. Over the course of the semester I researched how the Latino community has faced and continues to face racism in the United States. I began by addressing the history of Latino immigrants in the United States. I then followed up this section by examining political issues such as laws that have affected the Latino community. My next section was an examination of racism and acts of both physical and psychological violence against Latinos such as hate crimes and racism through social media. Upon
completing these sections I concluded with examples of positive impacts that the Latino community has had and continues to have on the United States economy and culture and why the United States should be at peace with the Latino community.

Kayla A. Reininger (Nelsy Echavez-Solano, Hispanic Studies) El sistema de educación ESL hoy día y un sistema bilingüe: Una comparación (English: The current ESL system and a bilingual system: A comparison)

The United States education system is becoming extremely diverse and it is becoming increasingly necessary to examine the way our system educates students with LEP (low English proficiency). I examine the ESL (English as a Second Language) system as it exists today and compare it with a hypothetical bilingual education system, in which students would be educated in both their native language and English. This essay argues that a bilingual system of education would be more beneficial for students with LEP and allow them to reach their highest potential during their educational careers and beyond.

El sistema de educación en los Estados Unidos está cambiando a un sistema más diverso, y es impresionante que se examine la manera de que este sistema educa los estudiantes con LEP (baja competencia del inglés). Examinó el ESL (ingles como segundo idioma) sistema como existe hoy día y lo comparto con un sistema hipotético de educación bilingüe, en cual los estudiantes serían educados en ambos su idioma nativo e inglés. Este ensayo argumenta que un sistema de educación bilingüe sería más beneficioso para los estudiantes con LEP y permitiría que ellos pudieran alcanzar su potencia más alta durante sus carreras de educación y más allá.

Tyler J. Torborg (Patricia Bolanos-Fabres, Hispanic Studies) Plan of action/prevention to improve air quality in Santiago Chile

The purpose of this research is to identify the best plan of action to fix the pollution problem in Santiago Chile. Some of the ideas brought up when addressing possible plans of action/prevention are; planting more urban trees, decreasing car traffic, promoting public transportation, and increasing efficiency in all aspects related to pollution. Along with the action plan economic, social, and political factors are also analyzed. This study will indicate that an action/prevention plan that encompasses all of these ideas will be the most effective to fix the pollution problem in Santiago.
Amberly E. Warner (Patricia Bolanos-Fabres, Hispanic Studies) The Water War: Cochabamba, Bolivia

This presentation explores the events of Bolivia’s “Water War,” which took place in 2000 in the country’s second largest city, Cochabamba. Research explores how and why grassroots, indigenous-led organizations successfully foiled the Bolivian government’s plan to privatize water via a contract with “Aguas del Tuanari,” a multinational company whose main investor is the U.S.-based corporation, Bechtel. Furthermore, the project aims to show how this process has effectively resulted in the cultivation of greater cultural cohesion and ethnic pride among Bolivians. Finally, it assesses the ways in which the Water War has made possible alternative avenues for constructive social and political change.

NATS

Brian J. Bohman (Joseph Storlien, NATS) Where did all of my fertilizer go? - Comparing Nitrogen-loss predictions from the Adapt-N model to measured in-field values in Minnesota.

Nitrogen fertilizer applications represent both a major environmental and economic impact within agricultural systems. Nitrogen is commonly the most limiting nutrient in agricultural fields, and some producers apply N-fertilizer in excess to achieve maximum crop yields. However, N-fertilizer applications are done at a high financial cost to producers and excessive N is subject to loss via aqueous and gaseous forms, which can negatively impact air and water resources. Applying N-fertilizers at maximum efficiency is ideal, but is significantly difficult for crop producers to achieve. However, the recent development of user-friendly, adaptive models provides producers with an additional tool to manage and control N within their fields. One such model, Adapt-N combines modeling of site-specific soil and crop biogeochemical processes with high-resolution climate data to provide adaptive and real-time information to producers. Models like Adapt-N also serve as a valuable resource to researchers interested in understanding, predicting and mitigating future N losses. However, the accuracy of predictions of N-losses to surface and ground waters, or through gaseous emissions has not been thoroughly tested. Using datasets collected from the Minnesota Discovery Farms project, this study used Adapt-N to model and compare predicted losses from aqueous N-leaching to in-field measured losses of N. The goal of this study was to determine the accuracy of this model in order to provide input to model makers, local users, and stakeholders and reduce the negative environmental impacts of agricultural N.
Hypoplastic left heart syndrome (HLHS) is a congenital birth defect that negatively affects the flow of blood through the fetal heart due to several abnormalities in the fetal heart. Multiple structures in the left side of the heart are affected by this condition. The left ventricle is largely underdeveloped, the mitral valve is absent or significantly immature, and the aortic arch is drastically undersized. In babies with HLHS, the left side of the heart is so underdeveloped that it ineffectively pumps oxygen-rich blood to the body. Unfortunately, the underlying cause of HLHS is unknown and further research is needed. Our proposal for the cause of HLHS suggests a cascading malformation that begins with infectious bacteria and results in the signs and symptoms present in patients with hypoplastic left heart syndrome. Our hypothesis is realistically testable and seeks to explain cases that occur in the absence of family history and other risk factors.

Krystal M. Heinen (Barbara May, NATS) The application of a structurally simple, recyclable, and large-scale L-prolinamide catalyst for asymmetric aldol reactions

This presentation will discuss the research performed in Chongqing, China at Southwest University during the summer of 2013. A highly efficient, bifunctional prolinamide catalyst, which consists of chiral proline and trans-cyclohexanediamine moieties, was prepared and evaluated in the direct asymmetric aldol reactions of various ketones and aldehydes. The catalyst displayed impressive catalytic activity toward heterocyclic ketones containing oxygen, sulfur, or nitrogen, which have not been sufficiently explored in the past. The substrate scope also covered cyclic and acyclic ketones. With heterocyclic ketones or cyclohexanone, the aldol reactions gave products in high yields and with respectable enantioselectivities (87-99% ee) and diastereoselectivities (up to >99:1 anti/syn). The catalyst could be recycled and reused up to seven times resulting in good yields and with good selectivities. It is also efficient in large-scale reactions with the enantioselectivities remaining at the same level as in the experimental scale reactions.

Political Science

Frida Alvarez (Christi Siver, Political Science) What factors explain the role of music, like narco corridos, in promoting illegal behavior as part of culture?
What factors explain the role of music, like narco corridos, in promoting illegal behavior as part of culture?

Eduardo Brandi (Christi Siver, Political Science) What factors explain increased global attention on war crimes?

What factors explain increased global attention on war crimes?

Theresa Curwick (Christi Siver, Political Science) What factors drive students to strike in Latin America?

What factors drive students to strike in Latin America?

Kathryn Eischeid (Christi Siver, Political Science) What factors explain variation in national health care systems?

What factors explain variation in national health care systems?

Diana Elhard (Christi Siver, Political Science) What explains variance in state compliance with the UNHCR policies related to refugee resettlement?

What explains variance in state compliance with the UNHCR policies related to refugee resettlement?

Amanda Furru (Christi Siver, Political Science) Why do countries vary in their responses to environmental problems?

Why do countries vary in their responses to environmental problems?

Lucas Giese (Christi Siver, Political Science) What factors explain the tactics of separatist movements?

What factors explain the tactics of separatist movements?

Sarah Haas (Christi Siver, Political Science) What factors explain why states sign human rights treaties?

What factors explain why states sign human rights treaties?

Dennis (Zhiyuan) He (Christi Siver, Political Science) Why do countries have different population control policies?
Why do countries have different population control policies?

Nicholas Hedman (Christi Siver, Political Science) Why do countries choose to adopt international currencies?

Why do countries choose to adopt international currencies?

Cody Hollerich (Christi Siver, Political Science) Why do countries bid to host international sporting events?

Why do countries bid to host international sporting events?

Jacob Hruska (Christi Siver, Political Science) Why have far right parties grown in strength and popularity in Europe?

Why have far right parties grown in strength and popularity in Europe?

Haruka Kimura (Christi Siver, Political Science) What factors explain countries’ investments in social welfare?

What factors explain countries’ investments in social welfare?

Aaron King (Christi Siver, Political Science) What factors explain civil conflict in countries with large resource endowments?

What factors explain civil conflict in countries with large resource endowments?

Michael R. Macken (Matthew Lindstrom, Political Science) Eugene McCarthy Centennial Project

The overall purpose of the McCarthy Centennial Project is to showcase life and legacy of Senator Eugene McCarthy. The research of this particular facet of the project is aimed at learning what McCarthy had to say about issues that persist to this day, and evaluate whether he addressed them in a way relevant enough to inform contemporary political discourse. The research was conducted in the archives of Senator McCarthy at the Minnesota Historical Society, the Andersen Library at the University of Minnesota, along with the selected materials from the Alcuin Library at Saint John’s University. McCarthy’s papers from these three locations cover a broad range of materials, from extensive documentation of his 1968 presidential campaign, to both transcripts and recordings of political
speeches made throughout his political career, to various articles, op-eds, and creative pieces he had written throughout his life, along with various pieces of memorabilia. The research also incorporated various interviews conducted by the author with those who knew McCarthy, either personally, professionally, or as biographers. The results of this research included a paper, "Unraveling the Enigma", which argues that McCarthy's most valuable contributions were in the topics of ethics, religion, the role of the U.S. in world politics, and campaign finance reform. The research also produced a digitized collection of McCarthy's speeches and writings on these topics that is planned to be published online.

Hanna Pioske (Christi Siver, Political Science) What explains varying levels of human rights in countries that have Sharia courts?

What explains varying levels of human rights in countries that have Sharia courts?

Richard Podvin (Christi Siver, Political Science) Why were there numerous regime changes in Latin America during the 20th century?

Why were there numerous regime changes in Latin America during the 20th century?

Jessica Raboin (Christi Siver, Political Science) Why are countries forming Higher Education Institutions (HEIs) with other countries?

Why are countries forming Higher Education Institutions (HEIs) with other countries?

Jacob Shawback (Christi Siver, Political Science) What factors explain variance in government capacity to control the international drug trade?

What factors explain variance in government capacity to control the international drug trade?

Jacob Stock (Christi Siver, Political Science) Why do indigenous movements demand sovereignty?

Why do indigenous movements demand sovereignty?

Robin Swingley (Christi Siver, Political Science) What factors explain how countries address the needs of their aging populations?
What factors explain how countries address the needs of their aging populations?

Ma Ka Lia Vang (Christi Siver, Political Science) What factors make countries vulnerable to military coups?

What factors make countries vulnerable to military coups?

Louis (You Nan) Zhao (Christi Siver, Political Science) What factors explain variation in success of democratic movements in East Asia?

What factors explain variation in success of democratic movements in East Asia?

Psychology

Nicole C. Argudin, Andrew S. Harmon (Robert Kachelski, Psychology) Effects of Interruptions on Primary Task Performance

The purpose of this experiment was to test whether interruptions had an effect on primary task performance. The participants completed two different primary tasks; 1) reading a passage followed by a brief comprehension quiz on the passage and 2) a memory card game. On some trials, the primary task was interrupted several times by a pop-up screen, to which the participant had to respond before continuing the primary task. The dependent variables we measured were the scores on the reading comprehension quizzes and the number of card flips required to successfully complete the memory card game (with fewer card flips corresponding to more accurate memory). On both tasks, we predicted that participants would have lower accuracy scores on trials that included interruptions than on trials that did not include interruptions.

Victoria Beach, Angel Aguilera, Paul Kress, Colin Fischer, Megan Lutz (Abraham Immelman, Psychology) The Personality Profile of 2016 Presidential Contender Scott Walker

Biographical and life history data concerning prospective Republican presidential candidate Scott Walker was collected from media reports and synthesized into a personality profile using the third edition of the Millon Inventory of Diagnostic Criteria (MIDC), which yields 34 normal and maladaptive personality classifications congruent with DSM-5. The poster
describes Walker’s personality profile and outlines its implications for leadership.

Zachary Bigaouette, Tyree Kidd, Sarah Catcher (Abraham Immelman, Psychology) The Personality Profile of 2016 Presidential Candidate Marco Rubio

Biographical and life history data concerning Republican presidential candidate Marco Rubio was collected from media reports and synthesized into a personality profile using the third edition of the Millon Inventory of Diagnostic Criteria (MIDC), which yields 34 normal and maladaptive personality classifications congruent with DSM-5. The poster describes Rubio’s personality profile and outlines its implications for leadership.

April L. Donovan, Demetre Koukouves, Natalie Lambert, Shuhan Yi (Abraham Immelman, Psychology) The Personality Profile of Prospective 2016 Presidential Candidate Rick Perry

Biographical and life history data concerning prospective Republican presidential candidate Rick Perry was collected from media reports and synthesized into a personality profile using the third edition of the Millon Inventory of Diagnostic Criteria (MIDC), which yields 34 normal and maladaptive personality classifications congruent with DSM-5. The poster describes Perry’s personality profile and outlines its implications for leadership.


The purpose of this experiment was to test whether the word used to describe non-religious believers (atheists or non-believers) has any effect on people’s attitudes toward them. To test this, we first had participants read a brief paragraph containing prevalence statistics and demographic trends for different religious affiliations, including non-religious believers. For half of the participants, the word “atheist” was used to identify this group; for the other half, the word “non-believers” was used. Participants then completed an implicit measure of their attitudes toward this group using the implicit association task (IAT). Next, participants answered a set of items that served as our explicit measure of their attitudes. Lastly, we measured the religiosity of the participants. We predicted that, on both implicit and explicit measures, participants exposed to the word “atheists” would have more negative attitudes than participants exposed to the word “non-believers”. Another hypothesis was that participants with higher levels of
religiosity would have more negative attitudes toward non-religious believers, regardless of which word was used, than would participants with lower levels of religiosity.

Demetre Koukouves, Emily Berthiaume, Matt Plessel, Joseph Wonderlich (’10) (Abraham Immelman, Psychology) The Personality Profile of 2016 Presidential Contender Mike Huckabee

Biographical and life history data concerning prospective Republican presidential candidate Mike Huckabee was collected from media reports and synthesized into a personality profile using the third edition of the Millon Inventory of Diagnostic Criteria (MIDC), which yields 34 normal and maladaptive personality classifications congruent with DSM-5. The poster describes Huckabee’s personality profile and outlines its implications for leadership.

Aubree P. Mickelson, Briana L. Plantenberg, Abbi L. Reineccius (Robert Kachelski, Psychology) Face-Name Memory for Symmetrical and Asymmetrical Faces

The purpose of our research was to determine whether the symmetry of faces would have an effect on people’s ability to recall names associated with those faces. We also wanted to determine whether gender would have an effect, with either a same-sex or opposite-sex bias on ability to recall names. In order to test this idea, we showed participants asymmetrical and symmetrical faces, and each face was paired with a name. There were an equal number of male and female faces. After they studied the face-name pairs, participants were shown the faces again without the names and asked to recall the name associated with each face. We predicted that participants would have better recall of names paired with symmetrical faces than asymmetrical faces, as well as better recall for names paired with faces of their own sex than with faces of the opposite sex.

McKenzie Neu, Joe Trenzeluk, Alexandra Latanision, Emily Lueck, Jack Schweich (Abraham Immelman, Psychology) “Sit Down and Shut Up!” — The Personality Profile of 2016 Presidential Contender Chris Christie

Biographical and life history data concerning New Jersey governor Chris Christie, prospective Republican candidate in the 2016 U.S. presidential election, was collected from media reports and synthesized into a personality profile using the third edition of the Millon Inventory of Diagnostic Criteria (MIDC), which yields 34 normal and maladaptive personality classifications congruent with DSM-5. The poster describes
Christie’s personality profile and outlines its implications for executive leadership.

Atarah Pinder, Yilian Li, Theresa Hickman, Sarah Blaida, Anna Wagner, Yee Her (Abraham Immelman, Psychology) The Personality Profile of 2016 Presidential Contender Ted Cruz.

Biographical and life history data concerning Republican presidential candidate Ted Cruz was collected from media reports and synthesized into a personality profile using the third edition of the Millon Inventory of Diagnostic Criteria (MIDC), which yields 34 normal and maladaptive personality classifications congruent with DSM-5. The poster describes Cruz’s personality profile and outlines its implications for leadership.

Joi C. Saddler, Kanisha L. Howard, Jessica E. Davison (Robert Kachelski, Psychology) The Effects of Music Tempo on Behavior and Emotions

The purpose of our experiment was to determine whether different music tempos would have an effect on people’s behavior and their emotional reactions. In order to test this, we had participants complete two tasks and a mood inventory while under different music conditions. One group had no music playing (control), a second group listened to music with a slow tempo, and a third group listened to music with a fast tempo. The tasks used were a basic math test and a letter detection test. These were used to see if the tempo of the music affected how quickly and accurately the participants completed the tasks. A mood inventory was used to see if the tempo of the music had an effect on participants’ moods.

Katherine Stelzner, Anh Doan, Natalie Gannon, Katie Miller (Abraham Immelman, Psychology) The Personality Profile of 2016 Presidential Candidate Rand Paul

Biographical and life history data concerning Republican presidential candidate Rand Paul was collected from media reports and synthesized into a personality profile using the third edition of the Millon Inventory of Diagnostic Criteria (MIDC), which yields 34 normal and maladaptive personality classifications congruent with DSM-5. The poster describes Paul’s personality profile and outlines its implications for leadership.

Katelynn Strelow (Robert Kachelski, Psychology) Physical Therapy Adherence: Communication Strategies and Role Modeling as Building Blocks
Physical therapy and patient adherence to physical therapy regimes at home are important for long-term health. The purpose of the present study was to research the possible relationships that role modeling behaviors and communication strategies that physical therapists use have with patient adherence. A total of 67 physical therapists answered a survey about effective communication strategies and beliefs about role modeling behaviors. The sections of the survey included attitudes towards role modeling, frequency of role modeling of healthy behaviors, frequency of use of effective communication strategies, and the frequency and number of communication strategies used in physical therapy education. One of the main results was that physical therapists who eat the recommended daily value of vegetables or exercise for the CDC-recommended values also reported using more communication strategies. It was also found that physical therapists who engaged in the CDC-recommended levels of exercise reported higher percentages of physical therapist-perceived patient adherence. Finally, there was a significant relationship between physical therapist age and the integration of effective communication strategy training. Due to the results, it was concluded that role modeling healthy behaviors and using effective communication strategies could play a role in physical therapist-perceived patient adherence.

Sociology
Walter R. Bugler, Loveleen Kaur, Sheng Yang (Jessica O'Reilly, Sociology) Religion at CSB/SJU for Non-Catholics

The presentation of our poster in a storyboard format is largely based off of a more broad documentary film project created for the purpose of understanding how different religions are practiced here on the campuses of CSB/SJU despite both campuses identifying as Catholic. This research will present how religion could potentially impact an individual's life here on campus. The religions that are analyzed within the film as well as on the poster-board are Catholicism, Islam, and Shamanism.

Nicole Cornell (Christopher Scheitle, Sociology) From Desecration to Institutional Vandalism: The Evolution of Legal Language

The criminalization of acts committed against places of worship has evolved over the last century. This study takes a preliminary look at the shift from the language of desecration laws to that of institutional vandalism laws across different states from the mid 20th century to the present. Laws for this study were accessed through the LexisNexis academic database. The laws were then analyzed for similarities and differences in wording and
content as well as trends in first passage. Preliminary findings of this study include a shift from the 1960’s-1970’s in which desecration laws were more commonly passed to the 1980’s-1990’s in which mostly institutional vandalism laws predominated. Accompanying this was a shift in the language of laws from defining criminalization by the object receiving the act and general offense of the public to defining by the intent of the offender. Additionally, it was found that most states tended to have either a desecration law or an institutional vandalism law, but most did not have both. Future research may be interested in looking for the effects and trends social movements had on law language throughout history as well as the effect neighboring states may have on each other in the passage of progressively evolving laws.

Chidi Ezeanioma (Jessica O’Reilly, Sociology) Cultural Appropriation in Hip Hop

My focus of study is an independent one. It could fall into one of the five categories given, the Cultural Appropriation category. While it is not about the cultural appropriation that took place last year during the senior exclusive tradition of FAMSAK, it is about a cultural phenomenon that has become so entrenched within today’s American pop culture. I am talking about the cultural appropriation of “Popular African American (Black) Culture in Hip Hop and Rap”. The idea for this study focus stems from the social conversation in hip hop surrounding a feud, or “beef”, involving rappers Iggy Azalea and Azalea Banks. Banks accuses Iggy for appropriating black culture and hip hop for her own monetary gain and making a mockery of hip hop as a music genre, culture, and lifestyle. From there is now a large spectrum of conversation regarding a white rapper’s place and systemic prejudice and appropriation of black culture, along with a hesitant denial of black people and its culture itself that dates all the way back early Rock n Roll with Elvis Presley—especially in terms as to what is given it’s recognition in mainstream American culture. This topic serves a lot dual conversations and goes in depth. I plan to focus on the cultural appropriation of hip hop music in black specially using the Iggy vs. Banks beef as a familiar spring board of sorts. While I can say that it was impossible to have access to interview either Iggy Azalea, Banks, or any prominent/notable figure in hip hop I chose to touch base about this conversation and dilemma with the people on ground zero. Plainly speaking, I conducted my study through interview and have an interactive discussion with the people who have their part in fueling hip hop—the students and fans. First generating a consensus on what the understanding of cultural appropriation is, then bring this understanding into the realm of popular black culture in hip hop music.
Intercultural and Interracial tensions have been a growing cause of concern for many across the nation; with the racially charged protests surrounding police brutality this past year, and the intercultural insensitivity that has caused protests at St. Cloud Tech just a few weeks ago, one can see how intercultural competence and awareness are increasingly important for societal peace. But how does CSB/SJU fit into this picture of racial/cultural harmony, or lack thereof? Our group has spent this last semester trying to answer that question. Through a series of interviews about, and research into, the campus tradition of AMSAK and the culturally charged parties from last year’s FAMSAK and deeper issues of strained intercultural relations on campus, we have tried to put together the clearest picture possible of the ways intercultural tensions exist on campus, how they are addressed by administration, and how our students feel about cultural appropriation and insensitivity. The poster that we have put together seeks to help each of our community embers understand the unique ways the greater societal issues manifest on, and impact, our institutions.

Religious congregations aim to create a sense of the sacred within their walls. This feeling of sacredness is often threatened by congregations’ attempts to take issues of security seriously. Installing security systems, hiring security guards, or simply discussing issues of security with congregants brings profane problems into a sacred space. Using interviews with over fifty congregations from a variety of religious traditions, we explore the tension that congregational leaders have when it comes to balancing security concerns with their spiritual mission. Strategies include avoiding taking security measures, hiding security measures from members, and embracing security as a natural part of the congregation.

The commercialized sport of Rodeo is well known in American Society. However, there is a companion sport, which is lesser known among the population, Ranch Rodeo. This sport implements and embraces the
fundamental skills of Western cattle ranching, in which horse and rider
work together to herd and tend cattle in events that include sorting,
doctoring, trailer loading, and team penning. This research explores Ranch
Rodeo through a blended ethnographic and grounded theory approach,
including rider-participant and non-participant observation, as well as
interviews with key informants. The ethnographic account provided here
describes event “characters” and “character types,” and the events of a
typical weekend of Ranch Rodeo. In addition, this research focuses on the
application of Durkheimian and Weberian theoretical perspectives to the
events.

Erika Thurston, Heidi Hesse, Madeline Norgaard, Janna George (Jessica O’Reilly,
Sociology) Multicultural Education in Central Minnesota

This project was originally conducted for our Transnational Anthropology
class. We were instructed to create a film representing various issues/ideas
surrounding Multicultural Education in Central Minnesota. We have
conducted a series of interviews with various staff members from secondary
schools in Saint Cloud. We met with Anne Kobe (Work Experience/Career
and Technical Education Coordinator) Keith Logan (High School
Language Arts Teacher), and Julia Stanley (High School World Language
Teacher).

Within these three interviews we were able to get information about
the struggles transnational students/families face inside and outside of
school. We were able to get some personal stories, and even some advice on
how to improve multicultural education in Central Minnesota. Our goal
was to learn more about the multicultural approaches that are utilized in
Minnesota Education Systems. More specifically we wanted to know how
students/families with culturally diverse backgrounds assimilate in the
Central Minnesota School Systems. We have turned our film into a short
story board to inform people of our findings.

Maria Xiong, Yee Her, Sheng Her, Chaltu H. Doto (Jessica O’Reilly, Sociology)
Social Services for Immigrants and Refugees

Our storyboard project consists of data we have collected regarding social
services that are available to the Hmong community in Saint
Paul/Minneapolis and the Somali community in St. Cloud. We have
collected a substantial amount of information from social services utilized
by Hmong and Somali immigrants and refugees families. Our research is
focused on programs that provide basic assistance in helping refugees and
immigrants adjust to their life in America. Our data emphasizes the following:
- Services they provide
- How they communicate
- How successful when providing the services
- How often clients receive help
- How to reach out to the community
- Difficulties they face with the services
- What types of groups do they target

Jennifer N. Yang, Katee Meckeler, Sheng Xiong, Jeffry Anderson, Sinloria Macrae (Jessica O'Reilly, Sociology) Bridging the Gap: The St. Cloud Somali Community’s View of Illness and Disease in a Western Society & its Effects on Patient Care

In our ethnographic study, we looked at how the Somali people view illness and disease in a Western society. In addition, we looked at how differing views and cultural practices affected their treatment and interpretation of Western medicine. Due to the ongoing increase of Somali people in the United States, this topic is important in showcasing the difficulties that newcomers face when it comes to medicine and how these experiences shape their view of Western medicine. These difficulties include language barriers and cultural differences. Our main focus will be on the St. Cloud area due to its close proximity to the College of Saint Benedict and the fact that Minnesota has the highest percentage of Somali people in the U.S. The study involves interviews from a director of English learners at Discovery Community Elementary School, doctors at the St. Cloud Hospital emergency department and within the CentraCare clinic system, a Somali community health worker, and Somali college students. We found that there are numerous systems in place to help the Somali community residing in St. Cloud and elsewhere. However, the presence of a language barrier remains the largest problem faced by both the Somali and local community.

Great Hall 1, SJU

Environmental Studies
Maxwell Arko (Christopher Thoms, Environmental Studies) Shark Fin Soup and the Race to Save the Shark

Shark fin soup is a delicacy from China, which uses the fins of sharks as the staple ingredient, hence the name. To supply the demand for this dish, sharks are being harvested at unsustainable rates, causing dangerous changes to various marine ecosystems around the world. In this study I aim at
uncovering to what extent the disappearance of sharks and the shark fin trade has on marine ecosystems. I use Chinese consumption trends to demonstrate the correlation between an increase in demand for shark fins and a decrease in global shark populations. In recent years, ambitious anti-shark-fin campaigns, throughout China, have sparked a dramatic decrease in the sale and consumption of shark fin soup. By reviewing the literature on shark conservation and China's pro-shark efforts, I evaluate China's methods of reducing consumption and integrate those methods and alternative strategies into a collective plan for addressing shark finning on a global scale.

Brian J. Bohman (Jean Lavigne, Environmental Studies) Soil Characterization and Mapping using Gamma-Ray Spectrometry

Using in-field data collected from an agricultural research site in Burleson County, Texas, I created a map displaying known soil characteristics against the results of gamma-ray spectrometry study. The goal of this project is to determine the accuracy and predictive ability of an emerging method of soil sampling.

Nicolas Bradley (Jean Lavigne, Environmental Studies) CSB Tree Inventory and Assessment of the Population

The College of Saint Benedict Facilities and Grounds Departments initiated the tree inventory project in an attempt to better understand the species make up and health of the existing tree population. Through the CSB Office of Sustainability, Tyler Thompson, Alex Chocholousek, and I sampled each individual tree and took data on its basal diameter, GPS location, species, and general condition. Using this information, the CSB Grounds Department can learn how to effectively manage their tree population.

Nicolas Bradley (Jean Lavigne, Environmental Studies) Greening the Housing Stock: Comparing Retrofit and Net-Zero Homes to Reduce Carbon Emissions

The residential sector accounts for 21.9% of the United States carbon equivalent emissions every year. With such a large portion of our emissions concentrated here, the housing sector is one of the biggest contributors to global climate change and the United States needs to consider the housing sector as one of its top priorities in carbon reduction plans. To reduce carbon emissions from the housing sector, two options exist: retrofitting an existing home or building a new, net-zero home. What remains to be seen
is which option provides the greatest carbon savings in a cost effective manner. To determine this, a comparative analysis of a retrofit and net-zero home was conducted. Over 70% of home energy use is concentrated in home heating, water heating, and cooling. In these three sectors, the two home models, retrofit and net-zero, were compared on the grounds of cost, payback period, energy savings, and net carbon savings when installing energy efficient updates. Additionally, socioeconomic constraints were taken into consideration during analysis. Through research, it was found that retrofitting a home provides a better option for most homeowners. It is an economically feasible solution for all homeowners and results in a greater net carbon reduction than a newly built home.

Aaron Brake (Jean Lavigne, Environmental Studies) "Oh Deer!" Managing and Reducing Deer and Vehicle Collisions in Minnesota

The issue of wildlife and vehicle collisions is important in the United State due to the negative effects that collisions have regarding a driver's physical health and economic wellbeing. This issue is particularly relevant when it comes to deer and vehicle collisions. Each year in the United States there are over one million deer and vehicle collisions, which costs drivers over $1 billion in property damages. This issue, which is common in Minnesota, brings us to the focus on this paper: the attempt to find the most tangible and effective solution to help reduce the number of deer and vehicle collisions in Minnesota. The list of potential solutions researched includes the use of fencing, wildlife bridges, deer whistles and more. Through the collection and analysis of scholarly journals, articles, and case studies, as well as original research on the topic, I found that each collision site has specific qualities that dictate the most effective solution. Also, due to the sudden increase in the number of collisions during fall hunting season, a focus on collision reduction that time could make a significant impact on overall collision reduction.

Jacob Burr (Christopher Thoms, Environmental Studies) An Oasis in Parched Lands: An Analysis of Agricultural Irrigation Methods and its Sustainability in California

Each day in Central California, farmers irrigate their crops with large quantities of water. The purpose of this research is to investigate multiple agricultural irrigation methods in the arid central California, and determine if a sustainable method of applying water to crops is feasible. Background information on how water is transferred provides insight on California’s agricultural importance. Based on analyses of government data and surveys
on farmer water consumption I argue that despite advances in modern agricultural irrigation methods, a sustainable method of applying water to crops in an arid landscape is not feasible.

Jacob Burr (Jean Lavigne, Environmental Studies) Purple Loostrife Attacking Minnesota’s Shores

The invasive species purple loostrife is impacting wetlands in Minnesota and is increasingly becoming an issue. Purple loostrife forms dense barriers that prevents native species such as cattails. In this project, I will make a series of maps that show how purple loostrife has expanded its range. I will use data from the Minnesota Department of Natural Resources Data Deli and ArcGIS servers.

Adelaide Carlson (Jean Lavigne, Environmental Studies) CSB/SJU Admissions from Southern California

Each year, CSB/SJU accepts and matriculates students from Southern California. This GIS project seeks to analyze the spatial relationships between these students’ neighborhoods and the high schools they graduated from in recent years. This will help admissions officer better understand which areas of Southern California have students that are applying to the college.

Meghan M. Carter (Jean Lavigne, Environmental Studies) Nevada’s Recreational Activities

This map will offer alternative options for the tourist who wants to spend their time exploring Nevada’s beautiful wild landscapes, showing that there are other places to spend time besides “The Strip”. Nevada has many areas of land under conservation, including state and national parks, wildlife ranges and campsites. I will be mapping out the various roads and hiking trails through these areas, as well as campsites from different levels based on the camper’s interest ranging from the experienced camper to the family on vacation with a dog or R.V.

Meghan M. Carter (Christopher Thoms, Environmental Studies) Unsustainable Food Consumption and Human Health

Global food consumption patterns negatively affect human health while also contributing to environmental degradation, creating an unsustainable food production industry. I examine whether and how conventional
farming practices contribute to environmental and human health problems and offer the solution of organic farming. My analysis addresses how organic farming is both sustainable and healthier for the consumer. Food related diseases that I examined include diabetes, heart disease, obesity and food related allergies. Finally, I discuss how the consumer has been persuaded by large food production companies to continue purchasing unsustainably.

Michael Culshaw-Maurer (Jean Lavigne, Environmental Studies) Map of Performing Spaces at CSB/SJU

I worked with Fine Arts Programming to produce a map of performing spaces at CSB/SJU, with the purpose of directing performers to proper parking, loading, and performing areas. I used ArcGIS software and aerial photos to create a color-coded map that will help performers find the correct campus, locate parking areas, load their equipment into the building, and get to the correct room. Fine Arts Programming will be able to email this map to performers in order to facilitate a smoother travel and performance experience.

Sarah Evans (Jean Lavigne, Environmental Studies) Updated Map of the St. John’s Abbey Arboretum Sugar Bush

St. John’s has been producing maple syrup since 1942, but within the last few years faculty and students have begun to map collection data. This poster displays is a continuation of an ongoing study. Student has mapped the number and extent of taps for sap collection this year compared to recent years. This map also contributes to an ongoing study of production between 5/16th and 7/16th size spiles.

Alexander Frie (Jean Lavigne, Environmental Studies) Spatial Variation in Call Characteristics of the Guyanan Golden Rocket Frog

This study attempts to investigate spatial differences in the call characteristics of the Guyanan Golden Rocket Frog, Anomaloglossus beebei. Higher ambient volumes have been observed close to the waterfall that dominates A. Beebei's habitat and it is hypothesized that these noise levels should influence the characteristics of individual frog's calls. Pulse duration, pulse interval, pulse length, and pulse frequency of individual frogs at specific locations have been mapped around the area of Kaieteur Falls Guyana, A. Beebei's endemic habitat. This mapping was performed
using Arc GIS and interpolation was used to predict the spatial trends of the frog call characteristics.

Joe Fujan (Jean Lavigne, Environmental Studies) Salting with Sodium? Alternatives to Road Salt

During winter months, deicing chemicals such as sodium chloride are applied to roadways throughout North America and Europe to ensure drivers’ safety. These chemicals are harmful to the environment and the economy; they degrade soil compositions, harm wildlife, and damage public infrastructure and private property. The goal of this project is to examine the alternative deicing agents as well as alternative methods of application and pre-planning that would help lower the environmental and economic damage resulting from road deicing. I researched scientific journals and spoke with members of Minnesota Department of Transportation and gained insight that showed the effect of road salt on the environment, as well as articles that examined alternatives that can be used and their effectiveness. This research showed that methods of pre-wetting, and use of alternative chemicals such as CMA in specific areas is important. These practices alongside salt-sand mixtures are the best conventional techniques for minimizing salt use. Alternatives such as beet juice, cheese brine, molasses, as well as garlic salt have proven effective alternatives, but further studying is needed to determine their effectiveness long-term.

Daniel George (Jean Lavigne, Environmental Studies) Invaded: Lake Minnetonka’s Watermilfoil Problem

The negative effects that invasive species have on a native ecosystem is an issue that has for the most part not been properly addressed. Successful management techniques to combat invasive populations are limited, but continued development in research and management plans look to put an end to the disruption of ecosystems. Lake Minnetonka, located 20 miles southwest of Minneapolis, is a prime example of an aquatic ecosystem that has been invaded by alien species but has yet to develop a successful management plan to combat the invasive populations. There are two invasive species, Eurasian Watermilfoil (Myriophyllum spicatum) and the Zebra Mussel (Dreissena Polymorpha) which have invaded the lake and are having negative effects. For my research I analyzed what agencies are doing to manage Eurasian Watermilfoil (EWM) populations on the Lake and relate it to examples in the United States where EWM has been properly managed in lakes with similar characteristics. I also wanted to find out if the presence of Zebra Mussels make the management of both species more
difficult. With this information I wanted to develop a list of management techniques that could be considered in the successful management of EWM on Lake Minnetonka. To find out information on this topic I have research both the ecological background on Eurasian Watermilfoil and the Zebra Mussel along with what negative effects each has on ecosystems which. I also found information on management techniques that are being used by agencies to control milfoil populations on Lake Minnetonka. I compared this to examples of where there has been successful management of Milfoil with and without Zebra Mussels populations in the United States.

Maggie Gleason (Jean Lavigne, Environmental Studies) Minnesota Moose: An Analysis of Moose Decline in Minnesota

Over the past decade, the moose population in Minnesota has been rapidly declining. Experts believe that if current trends continue, the Minnesota moose population will be extirpated altogether by 2050. With the exception of Maine, moose are slowly disappearing from states throughout the moose’s southern range and experts are baffled as to why this is occurring. Addressing this problem and highlighting possible explanations for why moose populations are declining are of utmost concern. To figure this out, I have analyzed current state moose management plans for Minnesota, New Hampshire, and Maine, in an attempt to determine what is being done successfully and what could be done differently to possibly restore the Minnesota moose population. It is most likely the case that multiple factors are coming together to negatively affect moose populations, but more research needs to be done to determine exactly why this decline is occurring. In the meantime, the MNDNR needs to continue to modify the current management plan in a way that they believe best benefits the moose population, and in order to maximize the potential of a resurgence of moose in Minnesota.

Hannah Haas (Jean Lavigne, Environmental Studies) Summer Art Festivals and their Proximity to Liberal Arts Colleges

I am working with an artist who believes that his art will be most widely accepted by the communities that surround liberal arts colleges. To help him, I am creating a map that shows the art festivals that are within a 25 mile radius of liberal arts colleges in the states of Minnesota, Iowa, Illinois and Wisconsin.
Hannah Haas (Jean Lavigne, Environmental Studies) Books Versus Nooks: A Consumer's Guide to Reading in a Digital World

Our society is one that relies heavily on the communication of ideas through the written word. With the introduction of the Amazon Kindle in 2007 and the many similar devices that followed, consumers of literature have been faced with a choice: Should they read the old fashioned paper books or should they read using an electronic reader? My goal with this project is to give consumers an answer. Starting with considering the reasons people choose to read (for work or for pleasure), and looking at a wide range of factors such as cost, comprehension levels, convenience, environmental impact, accessibility, number of titles available, digital rights, and the market, I created a rubric to be individually filled out by the consumer. Based on their answers, I suggest what they should use to consume the written word.

Peter Hamel (Jean Lavigne, Environmental Studies) Lakefront Property Possibilities in Minnesota

In this GIS project I will be investigating possible locations to buy lakefront property in Minnesota. In this search I will focus on two main aspects of the lake. The first area of focus will be the percentage of lake shore that is developed. This will help determine how busy the lake will be. The second aspect I will focus on will be the location of the lake. For this portion I will isolate lakes that are within 25 miles of cities with a population over 25,000. The goal of this project is to find a lake that is not extremely busy while staying within a reasonable distance of shopping for groceries and other necessities.

Benjamin J. Hillesheim (Jean Lavigne, Environmental Studies) Addressing the Elephant in the Room: Fundamental Niche Reconstruction in Three Elephant Species in Relation the End-Quaternary Extinction Event

Environmental niche modeling (ENM) can be used to map the fundamental niche of a species based on known species occurrence points as well as associated environmental data. ENM can be a particularly productive tool when applied to paleontological studies, in which other indicators of population health are not readily available. In this study, I will reconstruct vegetation, temperature, and precipitation regimes at two different intervals, one in the Late Pleistocene and the other in the Early Holocene, and use GARP (Genetic Algorithm using Rule-Set Prediction) to gauge the suitability of elephant (Mammuthus americanum, Mammutthus
columbi, and Mammuthus primigenius) habitat in North America both
before and after the Younger Dryas event. By doing so, the study will
address the extent to which natural climate change played among elephant
species in the Quaternary extinction event.

Emily Hodorff (Jean Lavigne, Environmental Studies) US Race Patterns

The United States ethnicity of people has evolved over time. Immigration
patterns of the past have created the greatly diverse country we live in
today. These data patterns can be analyzed to help one better understand
how US was shaped. This study is going to focus on the US population
density broken down by race, from 1790 until the present. I am going to
calculate and map the total percent of the population within white vs
nonwhite communities. When specific ethnic data is available, 1900s and
on, I will create more individual maps of the total populations of each
specific race present. Once the maps are sequenced together, the history of
US race patterns will be revealed.

Emily M. Hodorff (Christopher Thoms, Environmental Studies) Efficiency: Total
energy consumption in various home heating systems

Heating systems play a very important role in colder climate homes. When
temperatures drop below freezing home dwellers need a constant flow of
heat inside but central heating systems can be expensive. I investigate and
compare the installation and monthly costs, lifespan, and BTU output of
three different heating systems (wood burning, propane furnace, and
geothermal) to find the overall most efficient system. Each system has its
own benefits, for instance heating power, and downs falls, such as high costs
or the use of nonrenewable fuel. Based on my analysis, I argue that the
most economical system for the consumer in terms of long term cost and
energy efficiency is geothermal heating.

Jennifer Husen (Jean Lavigne, Environmental Studies) Proximity of Cities and
Counties to Level I Trauma Centers

Major trauma is an injury that can lead to serious outcomes and death.
Major injuries can include motor vehicle accidents, falls, and assaults with
deadly weapons to name a few. Level I trauma centers provide the highest
level of surgical and medical care, and they can increase the chances of
patient survival by 20 to 25 percent. The American College of Surgeons
(ACS) has certified 107 adult trauma centers as level I, and four of these are
located in Minnesota. The purpose of this study is to determine how far
away cities and towns in Minnesota are away from level I trauma centers. Additionally, I expanded this model to the national level to see how far away counties are from these life saving treatment centers.

Kathryn Keller-Miller (Jean Lavigne, Environmental Studies) CSB Alumnae Donors

Several maps of the location of CSB Alumnae Donors were produced using GIS (Geographic Information Systems) for the CSB Office of Institutional Advancement, including a state, national and world map of donors. In addition, a template map was created for Institutional Advancement to use in their office for communication of Alumnae events to Alumnae in the area.

Mitchell Konkel (Christopher Thoms, Environmental Studies) Development of Sustainable Transportation

Transportation sustainability is an increasing concern as cities continue to grow and expand. Sustainability needs to be approached from environmental, social, and economic viewpoints. This paper will address changes in public and personal transportation and the introduction and integration of sustainable transportation and its effect on sustainability in multiple cities. I will start with a working definition of sustainability and then make comparisons between several cities. I will also be examining the decision making process specifically looking at development and investment strategies and what goes into making transportation infrastructure successful.

Mitchell Konkel (Jean Lavigne, Environmental Studies) Ambulance Service Areas in Central Minnesota

This project focuses on mapping the locations of hospitals, ambulance garages, and ambulance service areas for a twelve county region in central Minnesota.

Madelynn Longley (Jean Lavigne, Environmental Studies) US population density by county, broken down by gender

My project focuses on changing gender patterns in the United States. Starting in 1790, I map out the population of male vs. female by counties in the United States. This will be helpful to show population based on gender of counties throughout the decades and also to show which counties were populated during certain decades as the movement West took place.
Madelynn Longley (Christopher Thoms, Environmental Studies) What’s Growing, Farmer? Organic food and its appeal to consumers compared to conventional produced food.

The world food system is built on a complex network of farmers, producers, and consumers. Currently there are two distinct approaches to food production, one being conventional farming and the other being organic farming. Within the past three decades, more consumers are abandoning conventionally grown food and moving toward buying organic food only. The main focus of my research is to examine factors contributing to the current shift in consumer’s decision-making around the purchase of food. It is important to understand how the two current systems are set up, and how they have evolved into their current state. World economics, public health, education, community, and the environment have each played a role in the dramatic shift from conventional to organic farming. Under each of these spheres of influence consumers have changed their consumption habits to support organic farming over conventional farming.

Sarah McLarnan (Jean Lavigne, Environmental Studies) GIS Analysis of the Relationship Between Minnesota Invasives and Roads

The rate of spread of invasive species is directly related to society’s increasing mobility. This poster presentation will be an analysis of terrestrial invasive species and their proximity to major roads in the state of Minnesota using Geographic Information System (GIS). GIS data will be used to determine the proximity of terrestrial species observations to major Minnesota roads. A map will demonstrate results and correlation analysis will determine the significance of findings.

Madeline Norgaard (Jean Lavigne, Environmental Studies) The Sandpiper Pipeline

The Sandpiper Pipeline project proposed by Enbridge Energy Corporation is a 616 mile proposed pipeline route to transport 375,000 barrels per day of light crude oil from the North Dakota Bakken formation to a terminal in Superior, Wisconsin. Anticipated benefits include high paying construction and operation jobs, significant tax revenue, and reliable energy transport. Although this route is the shortest and least costly, it would traverse 302 miles across northern Minnesota’s high quality watersheds, wildlife habitats, and natural and cultural resources. First, I compared the political, economic, and environmental climate of pipelines constructed in
the past across the Midwest. Second, I analyzed government documents, public comments, newspaper articles, and testimonies involving the Sandpiper. I argue that oil pipelines are more contested today than pipelines built in the past due to 1) the mobilization and networks of concerned citizen groups, 2) the large number of people, communities, and landowners affected by development, 3) and an increased understanding of oil production’s impact on the local environment and climate change.

Jake Pekarna (Jean Lavigne, Environmental Studies) Radon Under the Radar: The Silent Killer in Minnesota

Radon (chemical symbol 222Rn) is a carcinogenic gaseous element that is known to cause lung cancer in humans when it is inadvertently inhaled in large enough quantities. The United States Environmental Protection Agency (EPA) estimates that radon cancer is responsible for 20,000 average annual deaths in the United States, and of those, 700 are from the state of Minnesota. The goal of this project is to understand the reasons why radon is taking so many lives in Minnesota each year, and more importantly, what are pragmatic ways of reducing radon exposure to Minnesotans. This research project analyzes radon as an environmental health problem within the state of Minnesota by looking at the sources of radon, ways in which it accumulates in residential households, methods of measuring and mitigating radon, and the policies that Minnesota currently has to alleviate radon exposure to homeowners. By analyzing radon in Minnesota, we can determine that there is lack of understanding, responsibility, awareness, and political involvement. If Minnesota is to improve the life quality for its citizens, these areas must be improved.

Daniel M. Phipps (Jean Lavigne, Environmental Studies) Park N’ Ride: A Potential Solution to High Traffic Volum in the Twin Cities

Using Graphic Information Systems I will look at and show how park and ride locations in the Twin Cities are being built as a response to increases in traffic volume and how this solution has been effective.

Daniel Phipps (Christopher Thoms, Environmental Studies) Fertilizer use on American Yards: An Infatuation with Lawn Care.

In many ways, a large and green lawn is a symbol of America. This paper looks at the American Lawn and landowners in order to better understand household fertilizer consumption in the United States. The focus is on the question, why do people care so much about the lawn? What factors lead to
fertilizer consumption for lawn care and how do we justify it while knowing that the environment is at risk? While most of the paper looks at the reasons/culture/expectations of why we have lawns, two other points of focus are the effect the chemicals have on the environment and alternatives to the traditional lawn.

Steven Pignato (Jean Lavigne, Environmental Studies) Farming in the United States; Looking Ahead for New Beginnings

The average age of farmers in the United States has become an issue of growing concern within the past several decades. According to the 2012 Census of Agriculture, released by the United States Department of Agriculture, the average age of farmers was 58.3 years, continuing an upward trend from previous censuses. As these farmers begin to retire, the other issue of land transition becomes even more concerning. In order to ensure an adequate transition of farmland, more beginning farmers will be needed. However, entering into farming poses major barriers to entry, such as financial and technical barriers, which can prove to be too great for the majority of beginning farmers. I argue that more attention and research must be given to the growing population of aging farmers, as well as providing beginning farmers with a larger amount of adequate technical and financial programs and organizations that will help address the barriers to entry and keep farmers on agricultural land.

Matthew Rogotzke (Jean Lavigne, Environmental Studies) Of Wolves and Deer

For my project I will be mapping a relationship between deer and wolf populations in Minnesota. My data will be from deer populations within the DNR data deli, accompanied by wolf population from the DNR, but also John Erb, a DNR employee who maps wolf populations through the use of radio collars.

I expect to find some correlation between the two populations, as the reintroduction of wolves into the region must show some type of decline in deer populations.

I am interested in this project because there have been wolf attacks on deer and dog alike on my family’s land in Duluth, Minnesota. Wolf tracks have been found regularly over the winter and the fall deer harvest yielded a lower than normal return.

Ben T. Rosburg (Christopher Thoms, Environmental Studies) Practicality of Using Wind Energy as an Alternate Energy Source More Frequently
I examine whether St. John's University has the potential to be powered from wind energy as opposed to conventional fossil fuel energy sources through an analysis of wind power and the wind energy industry. Aspects I consider include costs associated with the wind energy industry, the amount of land use that the wind energy industry requires per size of area to be powered, efficiency of the wind energy units, amount of energy that is demanded from a site such as St. John's University, drawbacks associated with wind energy, any negatives associated with the wind energy industry, and how they can offset negative climate change effects compared to conventional energy sources.

Joel J. Roske (Jean Lavigne, Environmental Studies) Mapping Equestrian Trails

For my GIS project, I will have mapped horse riding trails used by a local stable based in Richmond, Minnesota. Using GPS data points, I will display the segments of each riding trail that they use over a satellite image of the entire trail network. I also plan to calculate the lengths of each trail to provide a tool for instructors and guests to plan their ride.

Joel J. Roske (Jean Lavigne, Environmental Studies) Tackling Taconite: Iron Mining in Northern Wisconsin

In the Great Lakes area, the mining of metallic ores – in particular, iron – helped shape the economy and culture of the Midwest. Time and experience, however, have shown that economic gain often results in environmental costs. In this paper, I address a current proposal from a mining company to begin a taconite iron mine in northern Wisconsin. In conjunction with a discussion about the economic gains versus environmental costs of mining I attempt to determine whether mining in the unique area of the Penokee Hills presents sufficient benefits to warrant the environmental costs associated with the installation of a mine and processing plant. To bolster this analysis, I also consider past and present mining situations as case studies of either successful or unsuccessful mining operations based on their contribution to the local as well as national economy, their efforts both to reduce negative environmental effects and to reclaim the land after operations cease, and their overall cooperation with local politics and federal governing bodies. Through my research and case studies, I conclude that the mining of taconite iron in northern Wisconsin is inadvisable at this time given the poor political cooperation of the company in question, the likely environmental costs that strongly outweigh the potential benefits of job growth, and the regulations in place that
currently make reclaiming such an ecologically significant area economically infeasible.

Joel J. Roske, Nicolas J. Bradley (Troy Knight, Environmental Studies) Tree-Ring Research in the American Southwest

Dendroclimatology is the reconstruction of climate through the analysis of tree rings. Typically, tree-ring records in the American West cover only the last 1000 years. But we are working on creating a network of tree-ring chronologies in the upper basin of the Colorado River spanning the last 2000 years. Through field collection and cross-dating of Pinyon and Douglas Fir trees, we were able to extend two previously existing chronologies beyond 2000 years and increase their sample depth. We also discovered and collected samples from two new sites that show great potential to aid in future research. In the future, we hope to add to the sample depth and range to increase the validity of the climate signals in this area. This data will help us analyze the effects of drought on streamflow and human populations within the Colorado River basin.

Taylor A. Scheele (Christopher Thoms, Environmental Studies) Certified Coffee: The Environmental Responsibility Behind Your Cup of Joe.

Coffee is one of the most important commodities in the world. The methods and practices of growing coffee can have a large impact on local ecosystems and social systems in which it is grown, many of the impacts being negative. Coffee certifications are an attempt to improve the environmental and social sustainability of coffee production and close the distance between producer and consumer. Certifications have the potential to help regulate growing practices and encourage growers to produce coffee in a sustainable manner. This study examines various certifications and the impacts they have.

Taylor A. Scheele (Jean Lavigne, Environmental Studies) Twin Cities Racial Demographics and Parks

This GIS project will be on the access of community members to parks in Minneapolis and St. Paul. The project will be comparing demographics of neighborhoods with parks, and attempting to discern if there is inequality in access to, and a close proximity of parks based on racial or income demographics.
Growing residential suburbs and changing patterns of land use pose many threats to the natural environment. Land conversion to residential development has significantly increased following World War II and cities have continued to grow into sprawling suburbs. This project will analyze land use change over time through case studies of three different time periods in two vastly different metropolitan regions, Phoenix Arizona and Portland Oregon. By analyzing historical zoning and city limit data, I will show how these cities have grown and consumed the land from the late twentieth century to present.

Growing residential suburbs and changing patterns of land use pose many threats to the natural environment. Land conversion to residential development is the largest threat to biodiversity and changing the way land is consumed by housing development in the suburbs is essential to conserve land, natural resources and sustain biodiversity. Consumer’s pursuit of the American dream fueled the move outside of cities, and while suburbs convey the ideal place to live, their impacts on land and the environment are only increasing. This project analyzes conservation developments, urban growth boundaries, and sustainable alternatives to traditional residential development through three case studies and a literature review of the suburban sprawl movement.

The project involves creating a map for the Freeport Girl Scout Troop 252. The map includes all of the historical sites and buildings located in Freeport Minnesota along with an index including historical information, the year it was established, and the contact person for each location. Each member of the troop was responsible for finding data for separate locations within the town.

Ashleigh N. Walter (Jean Lavigne, Environmental Studies) GIS Project: Map of CSB/SJU alumni in the Elementary Education Field
This project produces a map of the site placement of alumni from the College of Saint Benedict and Saint John’s University working in the Elementary Education field. The map depicts employment locations for graduates across the state of Minnesota, along with a zoomed in depiction of the Twin Cities metro area. Included in the map are the name, graduation year, and major for alumni shown on the map. The project was produced on request of the CSB/SJU Elementary Education department, and data on recent graduates used in preparing the map was supplied by the department.

Bryce Wenberg (Christopher Thoms, Environmental Studies) Environmental and Ethical Implications of the Factory Farming Industry

My paper examines the environmental impacts and ethical implications that arise from the factory farming industry and the steps we can take in order to minimize the effects presented by these issues. These issues include water resource depletion, waste management and factory emissions. A detailed analysis of studies on factory farming in various fields shows a range of different perspectives on the matter. Expanding on these distinct perspectives I form a detailed description for a potential solution to the environmental harm caused by these facilities.

Chendan Yan (Jean Lavigne, Environmental Studies) Identifying Environmentally Overburdened Neighborhoods in Minneapolis

Environmental Problems are not confined to political boundaries and tend to impact population beyond their sources, yet some communities are more impacted than others. This GIS project calculates a Cumulative Impact(CI) Score of environmental hazards for each neighborhood in Minneapolis based on the following three measures: pollution burden, population characteristics, and living quality. The higher the CI score, the more environmentally burdened a neighborhood is. The scope of this GIS project is limited and it is the hope of many environmental organizations in Minnesota that Minnesota Pollution Control Agency will take the lead and develop a more scientific and comprehensive mapping tool for twin cities and beyond. An effective mapping tool for Minnesota will not only help policy makers attend to the needs of the most impacted but also community members become more educated, informed and empowered to better their living environments.

Preston Zimny (Jean Lavigne, Environmental Studies) Royalton High School Trail System
My project will be a client project for the Royalton High School Cross Country Team. It will attempt to provide them with a map of the trails behind the school that the team uses for training and racing. I will get the data by using a GPS system and walking trails to gather their information to input into GIS. I think that the map will include a raster to show the topography with line shapefiles to show the trails and their distances.

Pellegrene Auditorium, Pellegrene Auditorium, SJU

Entrepreneurship

Morgan Potter, Anna Nugent, Megan Boettcher, Joseph Lenczewski, Erin Wilson, Steven Pignato, Dung (Su) Nguyen, Megan Towle, Diana Elhard, Christopher Beeth, Bao Khang, Anna Cron, Jacob Shawback (Katie Vogel, Entrepreneurship)

Obbasa ain gállit: We Continue

This academic year, Extending the Link (ETL) researched, filmed, and produced a documentary focusing on the Sámi people. The Sámi are an indigenous people from the artic regions in Finland, Sweden, Norway, and Russia, which they call Sápmi. This year, ETL focused on the puzzle of what factors influence indigenous identity for the Sámi people. This question took the team across Minnesota to work with Sámi-Americans and to Sápmi to meet with and interview members of the Sámi community. The connections between and across the Sámi, Sámi-Americans, and indigenous groups around the world all show through in our final project, Obbasa ain gállit: We Continue.

Peter Engel Science Center 369, SJU

Biology

Jeff J. Anderson, Leah M. Ellman, Erin E. Guse, Sara R. Lundgren, Erin M. Medvecz, Maddie T. Olson, Connor M. Piechota, Sarah J. Wachter, Brian P. Waldron (James Poff, Biology) Biological Illustration 2015 Exhibition

Students enrolled in Biological Illustration are introduced to the use of four different techniques or media—graphite pencil, pen and ink, colored pencil, and watercolor—that are commonly used for rendering biological illustrations. Each student completed at least one illustration using each of the four techniques. Several of these pieces are on display in this exhibition.

The students also learned how to scan their images and use software like Photoshop and Illustrator to manipulate and edit their illustrations. Each student worked on an individual project to produce illustrations that
convey significant information about a topic. Samples of some of the projects are also on display.

Quadrangle 252, SJU

Gender & Women’s Studies
Emily J. Buchmiller (Patricia Bolanos-Fabres, Gender & Women’s Studies)
Consideration of Feminist Ethics in Business Ethics

This research paper examines the relationship between business ethics and feminist ethics in the workplace. It evaluates the effectiveness of the integration of business and feminist ethics in the United States and Sweden by analyzing case studies of different company's within the two countries. This research expects assess if the incorporation of feminist ethics in business makes it more successful based on employee well-fare as well as bottom line numbers.

Erica L. Skarohlid (Patricia Bolanos-Fabres, Gender & Women’s Studies) The effect of Transgendered Characters in Television

The way media depicts the roles of men and women often dictate our conception of gender and gender roles from a young age. While images of being appropriately masculine or feminine are presented, the lack of transgendered characters has been an issue. The increased exposure and diverse plot lines of transgendered characters in American television since 2005, has created more conversation and acceptance of the transgender community. This research will explore the various plot lines and demonstrate the impact they have had.

Quadrangle 339, SJU

Communication
Consuelo Gutierrez, Laura E. Ricci, Margaret A. Siegrist, Erica L. Skarohlid (Jeanmarie Cook, Communication) Language, Gender, & Culture Research Papers

Do Tangled and Frozen provide a new gender model for Disney animated films? Do male and female athletes experience media coverage differently? How does gender influence Chicano language and identity? Does Islamic feminism have egalitarian linguistic roots? These are examples of the rich array of research questions that arise when considering the intersections of language, gender, and culture. Laura Ricci, Erica Skarohlid, Consuelo Gutierrez, and Margaret Siegrist will summarize the results of their research
in Dr. Jeanne Cook’s Language, Gender, and Culture COMM360 capstone course.

_Simons Hall G40, SJU_

**Political Science**

Justin Markon, Bridget Cummings, Katie Tillman, Joe Dingmann, Garith Scherck, Ryan Doogan, Philip Kittock (Gaynor Haeg, Political Science) The Good, The Bad & The Ugly: Surviving the Honors Thesis Process

These POLS seniors survived the honors thesis process --- barely!!! Come and hear about the process. Get questions answered. Get ideas.

Justin Markon - "The Influence of Economic Performance in the 2014 Midterms: A Gubernatorial Tutorial"

Bridget Cummings - “Breaking News: A Woman Is Running”

Katie Tillman - “Why States Seek Membership in Supranational Institutions”

Joe Dingmann - “Legislated Equality: Gender Quotas in a Latin American Context and the Story of Mexico”

Garith Scherck - “‘Wildly Off the Mark’: Civilian Disregard of Military Guidance”

Ryan Doogan

Philip Kittock - “Attacking the Hydra: Leadership Decapitation and Terrorist Organizational Resilience”
Fine Arts Presentations:

Art

Schedule

1:30 - 2:30 PM
Art Art 120  Jessie Sorvaag (Samuel Johnson, Art) Side by Side

Abstracts

Sorvaag: By investigating the juxtaposition of the spiritual sacrifice between life and death grounded in my relationship with animals, as well as discovering the capabilities of paint as a medium, I hoped to create a body of work that encourages thought and discovery of tension and conflict, both within the work and within the viewer. This project helped create an environment of thoughtful creation, research, and investigation that will continue to influence me beyond the completion of this semester. This work is as much about the viewer and their reaction, as it is about my own internal investigation into juxtaposition, conflict, and tension. Not only is the subject matter thought provoking, but the process that I found myself engaged in to create my work was also full of struggle and pressure. My thesis covers my research, process, and reflection as it has impacted my final work being shown in the show “Wander”.

Music

Schedule

3:00 - 3:30 PM
BACA135  Elizabeth Ringle (Justin Zanchuk, Music) Foreign Influence on Early American Film Music

4:00 - 4:30 PM
BACA135  Karen M. Mize (John-Bede Pauley, Music) Wagner and the Women of Der Ring des Nibelungen

Abstracts

Ringle: Foreign composers who immigrated to the United States during the 1930’s and 1940’s influenced the musical sound now associated with the American film industry. One of the most influential composers was the Erich Korngold. Composing music for films during this time was a demanding and often under-appreciated job, though it paid well. There were many composers from Europe who
found it a good way to make a living in America when they were no longer welcomed in their native countries during the years leading up to and during World War II. Korngold, a musical prodigy from a Jewish family, grew up in Austria and produced his first opera when he was just 22. As anti-Semitic tensions began to rise in Europe, he found his music being less welcomed in Germanic opera houses. He was best able to support his family by scoring films in America during the winter, though he still considered Vienna to be his home and hoped to continue writing operas there. When Austria and Germany united under the Third Reich in 1938, Korngold was already in America so he had his family join him in Los Angeles. He was engaged in a special year-to-year contract with Warner Brothers which let him choose which films he would compose, allowing him more artistic liberties than his contemporaries. In 1945, after both his father and Hitler died, he went back to composing for orchestra, though he still made his home in America. Throughout his lifetime, when the musical fashion was to be atonal and reserved for the musical elite, Korngold kept his sound lush, consonant, and accessible to the average listener. He considered films to be opera without singing, and scored them the same as he scored his German operas. His influence on the world of film music can still be heard today, such as in the music of John Williams.

**Mize:** This study analyzes two gender-related influences on Richard Wagner’s portrayal of women in his operatic cycle, Der Ring des Nibelungen. The first influence is the collective portrayal of women and of gender norms in nineteenth-century German literature. This part of the study selects and analyzes important literary texts from the perspective of gender theory. The other influence is the series of tumultuous relationships Wagner had with women. By exploring autobiographical and biographical sources, this part of the study establishes aspects of Wagner’s worldview in relation to women and gender.
Humanities Presentations:

Communication

Schedule

1:00 - 3:00 PM
Quad 346
Sarah Berry, Andrew Doig, Blanca Dominguez, Julia
Eckart, Elizabeth Flaherty, Macy Kelly, Matiku Makori,
Sarah Ober, Charlie Odell, Rachel Raden, Anthony
Smith, Milton Sosa, Riian Winbush, Youmu Zhang
(Katherine Johnson, Communication) Creative projects
for Media Aesthetics class (Comm 240)

1:00 - 1:20 PM
Quad 344
Misee A. Yang, Panhia Lee, Lillia K. Khelif, Shelby S.
Groen (Karyl Daughters, Communication) Internet trolls
and the social taboo of studying sexual communication

1:20 - 1:40 PM
Quad 344
Madelaine Maney, Hannah Seeb, Ellora Parrington,
Chidi Ezeanioma (Karyl Daughters, Communication)
Sexting and Relationship Satisfaction

1:40 - 1:50 PM
Quad 344
Claire DesHotels (Karyl Daughters, Communication)
Gendered Public Response to Sex Trafficking

2:00 - 2:30 PM
Quad 339
Allison Fischbach, Jake Barrientos, Devon Fleck, Emily
Krych, Jordan Doetkott, Taylor Berry, Alex Lambert
(Jennifer Kramer, Communication) Intercultural Health
Communication Men’s Focus Group Results

2:00 - 2:10 PM
Quad 344
Jeremy L. Welter (Arie Putnam, Communication) How
the Great Recession Changed Perceptions of
Homelessness

2:10 - 2:20 PM
Quad 344
John M. Retica (Arie Putnam, Communication) Mikhail
Bakhtin, The Carnival and South Park
2:20 - 2:30 PM
Quad 344  Lillia K. Khelif (Aric Putnam, Communication) The Rhetoric of Arabic Rap & Hip/Hop

2:30 - 2:40 PM
Quad 344  Erin Wilson (Aric Putnam, Communication) A Mental Note: A discussion of film's rhetorical power

2:30 - 3:00 PM
Quad 339  Anna Pohlad, Amanda Yang, Anna Doyle, Consuelo Gutierrez, Dani Quintana, Elia Medina, Melissa Quintanilla, Olivia Hoffman (Jennifer Kramer, Communication) Intercultural Health Communication Women's Focus Group Results

2:40 - 2:50 PM
Quad 344  Jesse M. Craven (Aric Putnam, Communication) Building Jordan

2:50 - 3:00 PM
Quad 344  Taylor R. Berry (Emily Paup, Communication) Lady Gaga and the Art of Performance

Abstracts

Berry, Doig, Dominguez, Eckart, Flaherty, Kelly, Makori, Ober, Odell, Raden, Smith, Sosa, Winbush, Zhang: Katie Johnson's Comm. 240 (Media Aesthetics) class will present selected digital video projects developed for the course.

Yang, Lee, Khelif, Groen: Students in COMM368:Love, Sex, and Commitment conducted a study looking at the various forms of texting in committed romantic relationships. The study was conducted by word of mouth and online through Facebook along with presenting it to other courses and this generated 325 participants. From the data garnered, students were able to conclude that there were “internet trolls” interested in sabotaging the study by providing substantial qualitative data sets from which to gain insights into sexting and also into the perceptions of research about sex related topics. Therefore, this presentation will review the unexpected data that was collected as a result of conducting online research looking at sexting behavior in committed romantic relationships. Analysis of the qualitative data revealed several themes including sexism, bestiality, and attacks against Social Justice Warriors. The implications of these themes suggest that
there are negative stigmas surrounding sexting and sex research that will further be discussed.

Maney, Seeb, Parrington, Ezeanioma: Sexting is a relatively new behavior having emerged as part of the digital technology revolution. Although perceptions vary, sexting can be simply defined as sending and receiving sexually suggestive images, videos, or texts on cell phones. Much of the current sexting research focuses on negative physiological and legal consequences resulting from this form of digital communication. That work fails to acknowledge the potential functions of sexting in the context of committed romantic relationships. This presentation will summarize results of a study conducted by students in COMM368: Love, Sex, and Commitment looking at the frequency and relational implications of various forms of texting in committed romantic relationships. Results reveal significant correlations between texting behavior and relationship satisfaction and indicate that long-distance relationships utilize sexting more often than geographically close relationships.

DesHotels: The 2014 Trafficking in Persons Report from the U.S. Department of State defines sex trafficking as “a commercial sex act induced by force, fraud, or coercion, or in which the person induced to perform such an act has not attained 18 years of age” (United States Department of State, 2014, p. 9). Discourse in the United States surrounding sex trafficking has increased in recent years and primarily focuses on legal measures surrounding its criminality. Although this discourse provides a necessary starting point, much of it fails to look at the root causes of sex trafficking. This paper seeks to address the underlying gender dynamics at play within sex trafficking, specifically within the public response to the crime. The act of sex trafficking relies on traditional sex role norms, which ultimately elicits a gendered response. Legal and activist discourse utilizes a common gendered rescue narrative to frame the issue of trafficking, which reinforces sex role expectations by focusing on vulnerable females rather than questioning norms of masculinity that perpetuate the issue. This paper discusses the context and actors involved in sex trafficking, the public response to the crime, and the sex roles and gendered constructs at work in the crime and proceeding discourse. These gendered constructs lie at the root of sex trafficking.

Fischbach, Barrientos, Fleck, Krych, Doetkott, Berry, Lambert: The students of the Intercultural Health Communication Capstone course, in conjunction with the St. John’s Health Initiative and St. Ben’s Health Advocates conducted a focus group with St. John’s students to understand the communication about health beliefs and traditions of international and underrepresented students. Specifically, we hoped to understand students’ biomedical and non-biomedical beliefs and practices
as they related to health. Major themes from the focus group will be discussed during our presentation.

Welters: In order to assess people’s representations of homelessness during and after the Great Recession I have performed an analysis of three editorial pieces published in the New York Times, from 2007 to the present.

Retka: Revolving around rural life in small, Colorado town, the show South Park presents viewers with a satirical depiction of United States current events. The show focuses on the lives of four fourth grade students. Eric Cartman, Kyle Broflovski, Stan Marsh, Kenny McCormick lead the way in this outrageously satirical cartoon. Originally, critics, academics, and concerned parents over looked the show due to its foul-mouthed nature. However, as the series just finished its eighteenth season on the air, the shows intellect and maturity have lead more individuals to dig for deeper meaning.

One specific episode that gained a lot of attention was the episode released roughly one week before the 2004 United States Presidential Election. The episode was titled “Douche and Turd” and crudely depicted the upcoming election in only a way that South Park could. The 2004 episode of South Park titled “Douche and Turd”, critiques the democratic process during that year Presidential Election and employs carnivalsque satire to argue for a sense of renewed individualism.

Khelif: This project analyzes the different channels of discourse utilized by Arabic Hip/Hop and Rap artists during the Arab spring. Artists such as Guito’n, El General, and Arabian Knightz specifically use rap as a means of revolt. This project examines why this medium is effective by comparing the restriction of free speech in Tunisia and Egypt with the rebellion spurred by specific songs such as Reyes Lebled, and Prisoner. Additionally, Arabic artists sample lyrics and dialogue from many popular African American artists and figures fighting for equality in the United States. This project will analyze the relationship between African American discourse and it's use in rap music worldwide.

Wilson: Film has been making an impact in society since it’s beginning. In our culture it seems to be normal to be influenced by what is on television and in movies. With this substantial impact that film has, it has the ability to alter one’s thought processes and social opinion. Film has had a very big influence specifically on societies opinion on mental health. There are countless films over the years that have helped create the stigma associated with mental health. One flew over the cuckoo’s nest, Silence of the Lambs, Shutter Island and Silver Linings Playbook are four films that span over a section of film’s lifetime that demonstrate the misrepresentation of mental health. An overview of these films and their impact are included in this paper. The films are discussed using three themes: First, the theme
of the portrayals of the mental health facilities; second, the portrayals of mental health professionals; lastly, the portrayals of methods of treatment for mental illness. These four films and three themes demonstrate how portrayals of mental health in popular films have created a stigma surrounding mental illness. This stigma has had an effect on the help-seeking behavior of those with mental illness in ways of deterring them from seeking help, as well as influencing those who have already sought help, to discontinue therapy.

Starting the discussion of films effect of help seeking behavior regarding mental health and addressing the stigma.

Pohlad, Yang, Doyle, Gutierrez, Quintana, Medina, Quintanilla, Hoffman: Students from the Intercultural Health Communication Capstone course, in conjunction with the St. John’s Health Initiative and Saint Ben’s Health Advocates, conducted a focus group examining health beliefs, traditions, and practices among international and underrepresented female students at the College of Saint Benedict. The purpose of this focus group was to determine where these beliefs and traditions came from and how they related to the participants’ cultures and communication. The major themes discussed during the focus group will be shared during this presentation.

Craven: On June 19th, 1984 with the third pick of the NBA draft, The Chicago Bulls selected Michael Jordan, a junior guard from the University of North Carolina. Since that time Michael Jordan has become one, if not, the most polarizing figures in sports. He is often said to be the greatest basketball player to have ever lived. Jordan mesmerized basketball fans all around the globe with his brilliance on the court, while also constructing a worldwide apparel brand, known today just as “Jordan”. During his career as a player, one of the ways Michael Jordan was able to catapult his image from star to icon was through the magazine Sports Illustrated, and the 50 covers that included his image. The focus of my paper is a detailed analysis of Michael Jordan’s representation on Sports Illustrated covers. Through my close examination of all 50 covers, it became clear to me that the Sports Illustrated covers created a visual narrative that depict Michael Jordan’s professional struggle to become a well-respected and successful individual, not just on the basketball court, but also in the business world as well. This paper argues that the Sports Illustrated covers that depict Michael Jordan have helped develop and define a distinct visual narrative, which includes specific themes that have framed the perception of Michael Jordan throughout his career on and off of the court.

Berry: Music has been instrumental in helping to create trends that society follows. The role of visual performance in the interpretation of music is as necessary, if not more necessary than the music and lyrics itself, to fully understand the artistic
message. This paper will examine three live performances created by Lady Gaga throughout her career. These demonstrate the value of an artist’s message through the live presentation of their work. It will claim that the interpretation of the music's meaning to the audience is shaped not only by the original work itself but is shaped even more by performance art.

**Philosophy**

**Schedule**

*1:30 - 2:00 PM*

*PEngl 244*

Nicholas Benson (Charles Wright, Philosophy) The Medical and Ethical Implications of the Changing Focus of Medical Practice

**Abstracts**

**Benson:** The Effects of Inadequate Measures when Determining Quality of Care: The past few decades have seen a gradual shift away from the standard practice of general practitioners towards a medical field dominated by specialists. The purpose of this study was to determine if there was any empirical data suggesting that the decreased levels of personal contact doctors have with patients results in a lowered quality of care. The evidence indicates that reduced doctor-patient meeting times is heavily impactful on overall treatment quality. Additionally, the increased stress and anxiety levels among medical professionals exacerbates the diminishing quality of care, due to a combination of the nocebo effect and reduced job proficiency. This paper uses the increased prevalence of complementary and alternative medicine (CAM) therapies in the U.S. as evidence for patients’ desire to return to a more personal and intimate healthcare setting.

**Theology**

**Schedule**

*1:00 - 1:30 PM*

*BAC A104*

David Wesson (Kristin Colberg, Theology) “Built for Building: Roman Catholic Liturgical Architecture as a Means of Evangelization”

*1:30 - 2:00 PM*

*BAC A104*

Kelly M. Benitez (Kristin Colberg, Theology) A Model for the Church Today: Monseñor Oscar Romero
2:00 - 2:30 PM
BAC A104  Theresa M. Hickman (Kristin Colberg, Theology) "A Push for Christian Counseling in Christian Schools"

2:30 - 3:00 PM
BAC A104  Brennan Hall (Kristin Colberg, Theology) Re-engaging Catholic Youth through a Relational Ministry

3:00 - 3:30 PM
BAC A104  Katrina L. Siebels (Kristin Colberg, Theology) A Revised Approach to Christian Fundraising

3:30 - 4:00 PM
BAC A104  April L. Donovan (Kristin Colberg, Theology) God as “She”: Incorporating Feminine Pronouns in our God-language

4:00 - 4:30 PM
BAC A104  Alyssa J. Terry (Kristin Colberg, Theology) Same God, Same-Sex: Developing a Broader Theology of Christian Relationships

Abstracts

Wesson: Since the liturgical reforms surrounding the Second Vatican Council, there has been a necessary reconceiving of liturgical space. This paper will discuss the role that active participation in liturgy plays in evangelism and how architecture serves as a means to these ends.

Benitez: This paper explores how Archbishop Oscar Romero serves as a model for the church today. It examines his efforts to become a voice for the voiceless and demonstrates how care for the poor lies at the heart of what it means to be a Christian. Ultimately this paper argues that Romero fits the criteria for sainthood because he truly exemplified what it means to be a follower of Christ.

Hickman: This paper examines why Christian Counseling should be integrated into Christian Schools. Differences between “secular” and Christian counseling are explored and how Christian counseling focuses on the needs of the whole person.

Hall: What would Catholic parishes look like if youth were not present? In this paper I argue that the current program-driven youth ministry disengages youth from the church community. True ministry with youth is built through relationship.
Siebels: People see fundraising as a necessary evil but could it be viewed as a vibrant ministry of the Church? This paper argues that Christian communities should see fundraising as a type of ministry. It explores fundraising in light of a theological understanding of Christian discipleship and a call to live in community.

Donovan: This project will argue that our language surrounding God is inadequate, as it does not illustrate the image of God present in women. I will examine the psychological effects of gender inclusive language and will question whether our current God-language represents the transcendent God of Christian theology.

Terry: The Catholic Church’s theological anthropology has a rich conception of freedom and relationality. I will explore how this anthropology could support a broader view of just sexual relationships including same-sex relationships.
Natural Sciences Presentations:

Biology

Schedule

2:15 - 2:45 PM
PEnGl 373
Michael Culshaw-Maurer (William Lamberts, Biology)
The induced heart rate response to fish kairomones in Daphnia pulex.

Abstracts

Culshaw-Maurer: The genus Daphnia, a group of small aquatic crustaceans, is an important component of freshwater lake ecosystems, serving as a link in the food web between algae and certain fish species, including bluegills. I studied the effects of chemicals released by bluegills on heart rate response in a clonal population of Daphnia pulex across a range of Daphnia body sizes. I used video microscopy to record Daphnia and measure their heart rate in response to control treatments and fish water treatments, then compared the degree of change in heart rate across multiple size classes. I found that only the smallest Daphnia size class had a significant response to the fish kairomones, whereas the larger two size classes had little to no response.

NATS

Schedule

2:50 - 3:10 PM
PEnGl 373
Krystal M. Heinen (Barbara May, NATS) A comparison of the anticoagulants warfarin and rivaroxaban

Abstracts

Heinen: Although originally introduced as a pesticide for rodents over 65 years ago, warfarin is now one of the most popular oral anticoagulant drugs in North America. Warfarin, commonly known by its brand name Coumadin, is used to prevent thrombosis, or blood clotting. Therefore, it is especially useful for patients with atrial fibrillation, a history of strokes, deep vein thrombosis, pulmonary embolism, and those undergoing an orthopedic surgery such as hip or knee replacements. However, due to its harmful side effects, costs, interactions with foods, prescription medicines, and over-the-counter supplements, and the demands of regular testing, new oral anticoagulants are being developed to minimize these drawbacks while still
Physics

providing the same anticoagulant effects as warfarin. This presentation will compare the mechanisms of action, benefits, and disadvantages of both warfarin and rivaroxaban (brand name Xarelto) which is a new oral anticoagulant approved by the U.S. FDA in 2011.

Schedule

2:00 - 2:30 PM  
**PEngl 167**  
Garrett Hedberg (Dean Langley, Physics) Acoustic Levitation: Optimizing Reflector and Circuit Designs for Levitation

2:30 - 3:00 PM  
**PEngl 167**  
Luke M. Loso (Sarah Yost, Physics) Infrared Distinction of Variable Stars

3:00 - 3:30 PM  
**PEngl 167**  
Raul A. Varga (James Crumley, Physics) All Sky Camera Analysis of Meteor Magnitude Distributions

3:30 - 4:00 PM  
**PEngl 167**  
Bryan Linehan (Thomas Kirkman, Physics) Simulating Neutrino Oscillation: Looking for Sterile Neutrinos

4:00 - 4:30 PM  
**PEngl 167**  
Vincent J. Burns (Sarah Yost, Physics) Matching Periods to Variable Stars

Abstracts

Hedberg: This study will describe the function and purpose of an Acoustic Levitation apparatus along with description of the components and devices used to drive the phenomena of levitation. The purpose of this study was to try to determine the optimal shape of reflectors in acoustic levitation as well as appropriate mediums for which to create reflectors. Experimentation was conducted using three glass lens reflectors and three, three-dimensional printed lenses (using PLA Plastic material). Previous research and experimentation determined that the radius of curvature of a reflector has significant effects on the power needed to achieve acoustic levitation. Radii of decreasing curvatures levitate heavier objects with less current driven through the levitator. Experiments with different mediums (i.e. glass and plastic) have now shown that the lens material has (less significant) effects on
the levitation. Experiments with PLA printed lenses proved to affect the current needed to drive levitation while maintaining similar radii of glass lenses. Similar masses required increased voltage and current from glass reflectors to plastic, as well as a change in the height $d$ from piston to reflector. Likely causes lay in the ability of the piston to build constructive wave interference in coherence with the different medium of the reflector. Although optimal shape was not determined, a concave-curved reflector proved to not contradict any previous research on the phenomena. Consistent shaped plastic lenses also proved to be better reflectors as well. Further experimentation may build upon this research and attempt levitation with differing shapes, and materials of reflectors.

Loso: Abstract

My thesis is about two types of variable stars known as Cepheid variables and RR Lyrae variables. Distinguishing between variable stars is a very difficult practice. Often multiple different properties must be taken into account when discerning variable stars. This thesis studies whether there is enough distinction of the infrared colors between RR Lyrae and Cepheid variable stars to classify them as different types of variable stars.

The colors of the two variable stars were found from the SIMBAD and WISE data base. Color magnitude graphs were made using histogram plots and color-color plots. The data was tested statistically to find any evidence of differences between the color ranges of the two types of stars.

The results indicate that there is a strong difference in the J-K and W1-W2 infrared color ranges. The histograms were difficult to distinguish and were not obviously different. When taking the statistical tests, the best colors were identified with a large probability value ($P$ value) and then plotted using color-color plots. The results indicate that Cepheids and RR Lyraes can be distinguished by comparing their infrared colors.

Varga: The aim of this thesis is to observe and analyze meteors over Saint John’s University from 2009 through 2014. In the first part, results from the entire 6-year meteor data set are presented along with the higher magnitude subset known as fireballs. The magnitude distributions of both these sets are discussed and analyzed using histograms. The analysis shows that for the entire data set, meteors observed range in magnitude between $6.888$ and $-8.011$ with an average magnitude of approximately $-1.568$ and a standard deviation of the mean of approximately $1.305$. The brighter fireball subset has meteors ranging only between $-3.001$ and $-8.011$, which is the rough magnitude limit for a fireball. Anything below $-3$ being a regular meteor and anything above $-8$ being a bolide or super bolide. The thesis then analyzes the magnitude distribution over each individual year and attempts to determine patterns or differences between both the complete data sets for each year as well as the fireball subsets for each year.
Linehan: In particle physics, it is currently known that three types ("flavors") of neutrinos exist that interact via the weak force. In a process called neutrino oscillation, the flavor of a neutrino can change as it propagates through space. At the moment, there is a discrepancy between expected and measured neutrino fluxes at low energies that suggests sterile neutrinos exist i.e., neutrinos that do not interact via the weak force. The goal of this project was two fold. First: to create Mathematica applications that calculate flavor transition probabilities when 1, 2 or 3 sterile neutrinos are assumed to exist, and second: to investigate current experimental data with the applications. The applications were completed and take the neutrino masses, mixing angles, and the CP symmetry violating constants as parameters. The investigation into current experimental data yielded no new insights. However, fits of experimental data using the created applications will be presented to show the potential utility of the applications.

Burns: Data measuring magnitudes of stars in the sky was taken from Northern Sky Variability Survey (NSVS) and from the Catalina Real Time Survey (CRTS). The NSVS data was spread over a year, while the CRTS was spread over seven. The NSVS matched periods to some of these objects, which means that they were variable stars. The first part of this project was interested in looking at the stars that the NSVS matched periods greater than 292 days to, and seeing if they could be confirmed by finding periods from the CRTS data. The second part was seeing if some variable stars were missed by the NSVS, by matching periods to them. The Lomb-Scargle method was used when trying to match periods. Although the program always matched a period, many of the periods were considered to be poor matches thus not showing the stars to be periodic. This project covered ¼ of the sky. Right ascension hours 02-04, 06-08, and 10-12 were covered. When trying to confirm the NSVS long periods, none of the matched periods were good. Therefore none of the NSVS variable stars could be confirmed. As for the second part of the project 118 periods were matched that passed all the criteria for it to be considered a strong fit.
Social Sciences Presentations:

Accounting & Finance

Schedule

12:15 - 12:35 PM  
Simns 310  
Joshua M. Russell (Warren Bostrom, Accounting & Finance) The Effects of Tax Inversions on the US Tax System

12:15 - 12:35 PM  
Simns 310  
Yilian Li (Warren Bostrom, Accounting & Finance) The foreign investment effects of tax treaty rates

12:15 - 12:35 PM  
Simns 310  
Maze E. Thompson (Warren Bostrom, Accounting & Finance) International Tax Reform

12:15 - 12:35 PM  
Simns 310  
Jacob Damhof (Warren Bostrom, Accounting & Finance) The analysis of lost revenue from corporate inversions.

12:15 - 12:35 PM  
Simns 310  
Cody Kirkeide (Warren Bostrom, Accounting & Finance) Tax Effects of Minnesota Sunday Sales Regulations

12:15 - 12:35 PM  
Simns 310  
Jack Hamilton (Warren Bostrom, Accounting & Finance) How Far Does Your Retirement Income Go In Different States

2:00 - 2:20 PM  
Simns 340  
Sara Brummer (Warren Bostrom, Accounting & Finance) When and Why CPA’s Leave Public Accounting

2:00 - 2:20 PM  
Simns 340  
Leah Schermann (Warren Bostrom, Accounting & Finance) Why Big 4?
John Moore (Warren Bostrom, Accounting & Finance)
The Correlation between a College Degree and Success in Entrepreneurship

Ryan Richardson (Warren Bostrom, Accounting & Finance) Internal vs. External Accounting in Small Business

Megan Schwegman (Warren Bostrom, Accounting & Finance) Careers Paths in Public vs. Private Accounting

Alyson M. Wendlandt (Warren Bostrom, Accounting & Finance) Recruiting Expenses in Public Accounting

John P. Haeg (Warren Bostrom, Accounting & Finance) Impact of new GASB rules 67 and 68

Yuquan Yu (Warren Bostrom, Accounting & Finance) Accounting Fraud Motivation and Governance

Michael T. Fischer (Warren Bostrom, Accounting & Finance) Trends in the Privatization of Public Companies

Michael J. Huber (Warren Bostrom, Accounting & Finance) Impact of Financial Statement Restatements

Mitchell T. Roers (Warren Bostrom, Accounting & Finance) Fraud and Restatement Impact on Stock Price

Joseph Zrust (Warren Bostrom, Accounting & Finance) PCAOB Deficiencies With Big 4 Audits
**Simns 340**  
Ngoc B. Hoang (Warren Bostrom, Accounting & Finance) Impact of International Assignments

**4:00 - 4:20 PM**  
**Simns 340**  
Brianna L. Ebert (Warren Bostrom, Accounting & Finance) Small Business Success Factors

**4:00 - 4:20 PM**  
**Simns 340**  
Andrew E. Norri (Warren Bostrom, Accounting & Finance) Is China a Sustainable Outsourcing Option for the US?

**4:00 - 4:20 PM**  
**Simns 340**  
YiQiu Zhao (Warren Bostrom, Accounting & Finance) The value of overseas accounting and finance related licenses

**4:00 - 4:20 PM**  
**Simns 340**  
Jiyuan Tang (Warren Bostrom, Accounting & Finance) The correlation between currency exchange rate and GDP

**5:30 - 5:50 PM**  
**Sextn Pub**  
Benjamin P. Rossini (Warren Bostrom, Accounting & Finance) The Accounting Fraud World

**5:30 - 5:50 PM**  
**Sextn Pub**  
Hollie M. Kroehler (Warren Bostrom, Accounting & Finance) Women CEO’s: How Their Companies Perform Against Competitors

**5:30 - 5:50 PM**  
**Sextn Pub**  
Joseph Duxbury (Warren Bostrom, Accounting & Finance) Financial Literacy vs. GDP, Unemployment, and Poverty Rates

**5:30 - 5:50 PM**  
**Sextn Pub**  
Mariah A. Ledeen (Warren Bostrom, Accounting & Finance) Can America Handle Paid Parental Leave?

**5:30 - 5:50 PM**
Sextn Pub

Joshua Matthys (Warren Bostrom, Accounting & Finance) Impact of Corporate Tax Rates on Foreign Direct Investment

Abstracts

Russell: I am looking at how much the US tax system has lost in the past few years due to companies employing an inversion strategy. I will also look to project how inversions will continue to effect tax revenues into the future based off of current data.

Li: This research is to find the correlation between foreign investment income and tax treaty rates by comparing the data of several countries with similar GDP, GDP per capita and geographical location.

Thompson: There is an estimated $2.2 trillion of foreign cash holdings. In other words, U.S. multinational corporations are moving business abroad, which is largely attributed to exorbitant U.S. corporate tax rate. Therefore, I am researching how the two current tax reform policies increase the U.S. corporate tax revenues.

Damhof: My research presentation will be taking a look at the effects of lost tax revenue from corporate inversions on the US government.

Kirkeide: I conducted research to construct an estimate of the tax revenues that Minnesota is losing due to the fact that sale of alcohol on Sunday is prohibited. I looked into other states that repealed bans on Sunday sales, as well as bills introduced to Minnesota Congress to calculate an estimate of how tax revenues may increase in the state.

Hamilton: My project takes a look at which states are the best to retire in based off of tax consideration and the cost of living. I put together a large Excel model that takes into consideration retirement income (including social security benefits), property tax, sales tax, income tax, and the cost of living index.

Brummer: As accounting students we hear a lot about how CPA's don't usually spend their whole careers working at a public accounting firm. I surveyed accountants who have left public accounting and accountants still in public accounting to determine why they did or might choose to leave and at what stage of their career. The purpose of the presentation is to present this data.

Schermann: My senior accounting capstone research is revolving around the question "What makes Big 4 job opportunities so attractive to students seeking
employment today?” In order to achieve a better understanding to this question, I looked at previous research via bloggers and other individuals with an insight to a Big 4 career, I conducted two surveys to send out to the junior and senior accounting students, and I also requested insight from CSB/SJU professors who have had the opportunity to work at a Big 4 firm themselves.

Moore: My project analyzes whether or not a college degree holds value for entrepreneurs to be successful. Through a survey of entrepreneurs and comparing successful entrepreneurs to their education level, I will draw a conclusion on whether having a college degree has any effect on whether entrepreneurs are successful or not.

Richardson: Small businesses need accounting work done - whether by internal accountants, external services, or both. I gathered a survey of small business owners about this topic and will present my findings on this topic.

Schwegman: I conducted a survey in which I sent out to accounting professionals to understand what sector of work they are in and why they chose it. This survey helps me to figure out whether going into public accounting at the start of one’s career is the best option and differences between the two sectors.

Wendlandt: Public accounting heavily recruits students through events and other presentations. They spend thousands of dollars yearly on these events. My research is aimed to see whether these expenses are beneficial to these companies and whether these expenses influence the potential employees' decisions on a company.

Haeg: My project looks at the impacts of GASB 67 and 68 in regards to pension plans. I analyzed the pension plans for state governments and computed different ratios that would be effected by the new GASB rules. I want to see what effect the new GASB rules will have on bond ratings for state governments.

Yu: Accounting fraud is still a hot topic in the 21st century. And it is also important for accounting students. I will analysis the real accounting fraud cases in the world based on fraud triangle, and analysis how to prevent it.

Fischer: What are the trends in the privatization of public companies? Initially looking at the Sarbanes-Oxley Act of 2002 and its effect on privatization, this research delves beyond some trends in public delistings from 2000-2005. Business factors and reasons to delist from the public stock exchange are examined in this presentation.
Huber: My research will focus on how a company is impacted by financial statement restatements. I will research this issue by examining stock prices after a company restates their financials, and by analyzing these changes for different restatement levels. This area of research is important because companies would benefit from learning about how a financial restatement could affect their company.

Roers: Fraud and financial statement restatement can have a major impact on a company’s stock price. The goal of my research is to see if there is a direct correlation between the amount of the fraud or restatement and how far the company’s stock price decreases.

Zrust: I will examine what are the most common deficiencies Big 4 firms are having with their PCAOB regulated audits. The research will include why these deficiencies are the most common.

Hoang: Given the increasing trend of global business transactions, more and more people and being deployed overseas for work. My research project aims to explore the potential financial or other long-term benefits entailed in accepting such assignments.

Ebert: For many, owning their own business is enticing, but what does it take to succeed and thrive as an entrepreneur? I conducted a survey of small business owners and asked them what they believe has contributed most to the success of their businesses. I will present these findings from my research in this presentation.

Norri: In this research project I will be looking at past and present trends to estimate future growth in China. One way of doing this was by looking at the wages of Chinese workers and finding a future breakeven point to the US dollar. Another way to compare was by looking at manufacturing costs in the US and China and finding a breakeven point there as well. By observing these areas I will concluded is China will be a sustainable outsourcing option for the US.

Zhao: I am analysing the value of the oversea accounting and finance related licenses included AICPA,ACCA,CICPA,CFA and CMA etc. I will cover a cost and benefit analysis related to all these accounting and finance related licenses.

Tang: The currency and GDP are two important tools to analyze the development of a country, therefore, my main point is to find the correlation between these two factors according to the historical data.

Rossini: I will take a close look at what types of fraud and unethical behavior occurred at Enron in the early 2000’s that caused the Sarbanes-Oxley Act of 2002 to
be initiated. Through survey and professional opinion, I will then try to measure whether or not these types of fraud and unethical behavior are still occurring at a similar rate today.

**Kroehler**: My research project focuses on how companies led by female perform in comparison to male led competitors. I conducted a ratio analysis of S&P 500 companies with women Chief Executive Officers and their competitors led by men. The purpose of this presentation is to compare the difference of the genders.

**Duxbury**: This project looks at the relationship between financial literacy and GDP unemployment, and poverty rates within the 50 states. This relationship is evaluated using a correlation analysis of financial literacy and these factors.

**Ledeen**: The United States is the only first world country to not offer paid parental leave for every state through a federal program. I researched other countries policies for paid leave and applied their methodology to America. Through my research I found out why The United States should have paid leave and also the cost of it.

**Matthys**: Corporate tax rates are a major factor for companies deciding whether or not to invest internationally. This project looks at how changes in the corporate tax rate affect foreign direct investment levels for countries.

**Exercise Science and Sport Study**

**Schedule**

3:15 - 3:35 PM  PEng1 373  
Josef M. Nelson (Stephen Saupe, Exercise Science and Sport Study) Effectiveness of creatine supplementation on anaerobic power and fatigue resistance in NCAA division I athletes

**Abstracts**

**Nelson**: This paper discusses the potential performance increasing effects of creatine supplementation. The purpose is to review scientific literature about the ergogenic effects of creatine supplementation on athletic performance, specifically in D1 athletes. The ability to express high power outputs is considered a foundational characteristic underlying successful performance in sport. As a result, many athletes turn to creatine to further increase their training adaptations. I will focus on the synergistic effects of resistance training coupled with supplementation and the resultant increased gains in strength and power. My study
will also focus on creatine supplementation’s ability to reduce fatigue and enhance recovery (resynthesis) by increasing creatine concentrations in the body allowing for delayed lactate production and resulting in prevention of acute strength loss induced by concurrent exercise. My study will also explore various subject response differences by examining supplement dosages, exercise stimuli, recovery bouts, and body compositions. Effects are highlighted by the strength and power gains experienced by resistance-trained athletes whose potential to improve strength may be limited. Supplementation is most beneficial for an ATP-CP dominant strength and power athlete that relies on short duration, high-intensity activities. There is no conclusive evidence supporting enhancement of endurance or submaximal intensity exercise. Creatine is a more effective training supplement than a direct performance enhancer as supplementation promotes improved quality of training sessions resulting in better performance. Supplementation can be beneficial in increasing athletic performance.

Peace Studies

Schedule

2:30 - 2:45 PM
Gorec 120
Jenna R. Maus (Ronald Pagnucco, Peace Studies) Understanding Islamophobia

2:30 - 2:45 PM
Gorec 120
Dilan A. Lyman (Ronald Pagnucco, Peace Studies) The peaceful fall of a dictator

3:30 - 4:30 PM
Gorec 120
Laura A. Becker, Kate M. Kennealy, Marie F. Nilles-Melchert, Jackie Perez, Erin M. Speltz, Nancy Sibri Guaman (Ronald Pagnucco, Peace Studies) Circles of Understanding Reflection

Abstracts

Maus: In recent years, anti-Muslim sentiments have been on the rise in the West. The 9/11 terrorist attacks and others carried out by Islamic fundamentalists such as the 2007 London underground transport system bombings and recent Charlie Hebdo attacks have contributed to an already present culture of fear of Muslims and Islam. These terrorist attacks, among others, have led to Islam becoming synonymous with terrorism. I will explain how the events of September 11, 2001
have had a discriminatory effect on the Muslim community in the United States. Specifically, I will address racial profiling and physical and verbal attacks and attacks on mosques and other Islamic religion centers.

Lyman: I will begin with a summary of Sri Lanka’s civil war and the threats it had on the country. I will then transition into how the start of the dictatorship took place and how through all the corruption and oppression, the dictator managed to convince people to vote for him because of the development and infrastructure he used to mask all of the corruption. Finally I will speak about the most peaceful transition into a true democratic and independent government who today are repairing much of the damage caused by what a Sri Lankan who knew of the wrong doings would call the dark ages for the country. Information on all these matters will be gathered from the Colombo telegraph, ground views, the UN, The EU and several NGOs. The information I receive will be quantitative and qualitative however as the dictatorship regime destroyed and falsified many of the numeric data, there may be some areas where the figures are not 100% accurate, however many of the atrocities were committed in plain sight and thus the their effects will be straight forward to address.

Becker, Kennealy, Nilles-Melchert, Perez, Speltz, Sibri Guaman: Circles of Understanding is a process of communication that is utilized to discuss challenging topics and work through conflict. Two circle events were held on campus this semester to further promote understanding on the topics of race and gender. Students were involved as participants and facilitators. The Circles of Understanding model incorporates sharing personal experiences and listening attentively to others. Students attending this event grew in awareness, empathy, and relationship with other students. Our presentation will be a reflection of our experience as facilitators. We will perform a live demonstration of a circle process in addition to elaborating more about what a circle process is, what they accomplish, their strengths and weaknesses, and other questions.
Interdisciplinary Presentations:

Environmental Studies

Schedule

2:30 - 4:30 PM  
*GHall 1*  
Cameron Axberg (Jean Lavigne, Environmental Studies)  
Shortest distance to AEDs on SJU campus. SJU EMT Squad partnership with HeartSmart Communities and American Heart Association

2:30 - 4:30 PM  
*GHall 1*  
Daniel N. George (Jean Lavigne, Environmental Studies)  
GIS Mapping: A Campus Map for Engineering Design Competition Students

Abstracts

**Axberg:** The Saint John’s University EMT Squad, as part of their initiative to make the campus a safe and healthy place for all campus residents and visitors, is partnering with HeartSafe Communities and the American Heart Association to better prepare the campus to manage and react to cardiac emergencies and to prevent cardiac emergencies by promoting healthy living. As part of this effort, a map of all the locations of AEDs (Automatic External Defibrillators) was made showing where the closest AED is located throughout the SJU campus in order to expedite cardiac care and increase awareness. The use of this map will allow for faster response times when a medical emergency occurs. Previous research has been shown that survival rates for cardiac arrest tend to decrease by 10% for every minute that defibrillation and CPR are delayed. Through the use of our map delays in administration of necessary cardiac care will decrease, improving survival rates in our community on the SJU campus.

**George:** For my research I developed a map for the Saint John’s University Physics department. This map was oriented for students who are attending the Engineering Design Competition that the Physics department puts on annually. This map was made for students to use in their brief off time. It includes a detailed map of different rooms in the New Science building; sites that are located around the Saint John’s campus, including the Great Hall, Refectory, Abbey Church, Sexton, Alcuin Library, and the HMML; and site descriptions to provide a brief background on the sites that students can visit.

Experiential Learning & Community Engagement
Schedule

2:00 - 2:30 PM
HAB 118  Justin S. Brooks (Jeffrey Diamond, Experiential Learning & Community Engagement) Mental Health Stigma in Japan

Abstracts

Brooks: This will be a presentation about the treatment and stigmas associated with the mentally ill in Japan. I created this presentation to bring attention to this issue, and offer some ways in which we can change it.