

2nd Annual Student OSCARS

Outstanding Scholarship, Creative Activities and Research Symposium

Friday, April 28, 2017

1:00-1:10 pm	Welcome and Opening Remarks; Student Center Commons, Corner Stage
1:10-2:00 pm	Oral Presentations; Student Center Commons, Corner Stage
2:00-4:00 pm	Poster Session; Student Center Commons, Courtyard and River Patio Sides
4:00 pm	Awards Presentation; Student Center Commons

Project Categories:

¹ Creative Performance/Presentation

² Humanities/Social Sciences

³ STEM/Health Sciences

Project Descriptions/Abstracts

Oral Presentations

1. Joehey Cici: Honors in Action – Youth Homelessness²

Phi Theta Kappa Honor Society, Faculty Mentor: John Herbert

As our Phi Theta Kappa chapter explored the Honors Study Topic, “How the World Works: Global Perspectives,” we discovered a common interest in investigating how different societies view adequate housing as a potential human right and the responsibilities that may be associated. To strengthen our research and teamwork, we developed our knowledge and skills in academic research, group communication, leadership, and the Phi Theta Kappa Honors in Action process. Our research led us to the conclusion that global communities have varying approaches to adequate housing as a personal right and to the correlated responsibilities, if any. Although controversy exists primarily about how to enforce an individual right to adequate housing, there is less conflict about whether humans have a basic right to a minimal standard of living. Youth homelessness has increased in recent years in Anoka County. Our team questioned whether strategies from other societies that have lower rates of youth homelessness could be used to reduce youth homelessness in our county. After collaborating with college and community partners, we discovered that many resources for homeless individuals exist, but the most urgent need in our community is the collection of local data about homelessness. We delegated responsibilities to a planning team and project team, such as organizing a timeline, documenting research, setting project objectives, collaborating with groups and individuals, and implementing a two-phase project to help reduce youth homelessness. We conducted a two-week item donation drive for HOPE4Youth, a homeless youth drop-in center, that doubled our goal with 1,068 donations. We also hosted two strategic planning sessions with HOPE4Youth at which about 60 community participants provided input on the root causes and most effective solutions to remove youth homelessness in our county by 2020.

2. Temitope Shosanya: Human Connection¹

ENGL 1121, Faculty Mentor: Jasmin Ziegler

Human connection. I believe it's a basic level in which we can all come together despite our odds or/and ideologies. There is something about humans connecting that gives me a warm feeling and has me hoping for a brighter future for everyone. That hope has come back to bite me in the butt several times

as I've tried to have discussions with those who didn't want to listen to another's perspective. Although, when I do connect with people, I'm happy that I do so because I know that that person is a little bit happier. And so am I. In this project, I'll be exploring human connection and how to have it among two parties that do not usually get along.

3. Julie Erickson: An Appeal to Planned Parenthood²

PHIL 1200, Faculty Mentor: Mo Janzen

In my presentation, I will argue that because Planned Parenthood is a championing organization for equality in women's health care, it should consider its current underrepresentation of perinatal hospice and palliative care services in women's reproductive health. Planned Parenthood, by its very mission statement, recognizes reproductive self-determination at the core of its goals as an organization. Yet in some cases, Planned Parenthood contradicts its mission to pregnant mothers through its current actions, especially to mothers who have decided to continue their pregnancies despite a life-limiting fetal diagnosis. Possible consequences and concerns resulting from underrepresentation of this important demographic of women include threats to autonomy, as well as the appearance of Planned Parenthood as a paternalistic entity. Planned Parenthood is the product of once-revolutionary ideas by its founder, Margaret Sanger. Because of this, and its prominence in women's health issues today I encourage Planned Parenthood to explore its influence as an example of tolerance and support toward opposing viewpoints in the name of societal progress.

4. Vladimir Petrenko: Integrating Undergraduate Research Experiences for Nurses – An Expansion of the Wolf Project³

BIOL 2114, Faculty Mentor: Paula Croonquist

Fifty percent of novice nurses incur nursing care errors (such as medication and IV fluid administration mistakes, treatment delay, and falls) associated with a critical thinking deficit. Undergraduate research has been identified as one of ten "high-impact" educational practices that promote "deep learning". Anoka Ramsey Community College biology faculty have recently developed a collaborative and cross-curricular learning opportunity for students to acquire relevant field and laboratory research skills in an innovative and hands-on learning experience. During this experience, students work with a population of captive gray wolves at our partnering non-profit organization, the Wildlife Science Center. Students capture and handle these animals and perform physical examinations, administer vaccines, and collect buccal cells, hair, scat, and/or blood specimens for further analysis. Our project aims to expand these relevant and novel research experiences to a health science course: Anatomy and Physiology II class required for the ARCC nursing program. Wolf serum samples collected by Field Biology students, were utilized by A & P II students to perform enzyme-linked immunosorbent assays (ELISAs) to detect immunoglobulins A and E (IgA and IgE) levels in endangered Mexican Gray, Red and thriving Great Plains Great wolves. The class' working hypothesis was that endangered wolves (Mexican gray and red wolves) have lower levels of these antibodies in serum than thriving controls, presumably due to inbreeding. Students analyzed their own ELISA data, graphed and interpreted it in light of this hypothesis by completing two consecutive critical thinking group formal assignments. Students found that the difference in IgA and IgE levels between endangered and thriving wolf subspecies is not statistically significant (p values above 0.05) however, there is a trend of IgA levels being higher in endangered when compared to thriving wolves. Conversely, the trend is opposite for IgE levels with endangered wolves having lower IgE levels than control animals. Our assessment data analysis utilizing the national standardized Human Anatomy and Physiology exam and the URSSA post survey administered by the Community College Undergraduate Research Initiative (CCURI) demonstrated that students performed

above the national mean in the HAPS Immunology's exam section and identified high gains in application of knowledge, working like a scientist and critical thinking skills respectively.

5. Chisom Owhonda: Life So Far¹
CMST 2220, Faculty Mentor: Stacie Mariette

This poem is about my life so far. It covers my journey in life so far as a teenager, questions about my faith, learning from past mistakes, love for my mother, peer pressure in my life, and dreams and set goals I have set for myself. It is a way of assessing what I have achieved so far in my life, and how I can achieve better things in my life. "Life So Far" is meant to reach out to anyone who goes through the same situations I do, and teach them that focus and hard work are the things needed to keep going strong and succeed in life.

Poster Presentations

6. David Cocherell, Rachel Cawthra, and Fanaka Ndege: Working as an Intern – Editors for Poetry City, USA¹

Internship, Faculty Mentor: Jasmin Ziegler

Poetry City, USA is an annually published national journal of poetry and prose on poetry open to all submissions. It has been publishing continually since 2011. Each issue is available on a limited basis in print, and free in cyber editions. One of Poetry City, USA's missions is to teach and nurture students in AFA in Creative Writing programs in the Twin Cities (Minneapolis and St. Paul) metro area. The goal is to teach student-editors how to be good readers, editors, and purveyors of poetry, and to help them as they navigate their careers and become poets, editors, publishers, teachers, et cetera. Poetry City, USA has three resident editors who work with a staff of assistant-editors affiliated with AFA in Creative Writing Programs at Anoka Ramsey Community College, Normandale Community College, and North Hennepin Community College. This project showcases the work of three assistant-editors (all from Anoka Ramsey Community College) of Poetry City, USA. David Cocherell, Rachel Cawthra, and Fanaka Ndege will demonstrate the editorial process, and what it is to generate a prose piece for publication in a national journal.

7. Paige Hanson: A Broken Connection²
ENGL 1121, Faculty Mentor: Jasmin Ziegler

How many times have you thrown away recyclable items in the trash without immediately thinking about the consequences to the environment? The reasons vary for lack of use of the recycling bins. Some people may be unsure what items are allowed in the recycling bin. Others may simply be in a hurry and find sorting trash inconvenient. Some people may not see the point in sorting their items into the recycling and garbage bins. I hope to bridge the gap between the perceptions of how small acts, particularly recycling, affect the environment with a sculpture. I would create sculptures made from recyclable items thrown into the trash that are recreations of photographs of animals that have been affected by garbage waste. My hope is that my sculpture would show that even small actions, such as making a choice between garbage and recycling, do have a direct impact on the environment. I would place these sculptures next recycling bins. Not only would this make the recycling bins more noticeable, but this would reward people with the instant gratification that they are helping the environment when they recycle. These sculptures would connect the act of recycling directly to its impact on the environment, giving the community a chance to participate in conservation efforts, and enlighten the community about their direct impact on the health of the environment.

8. Stephanie Ramon-Perez: Environmental Art²
ENGL 1121, Faculty Mentor: Jasmin Ziegler

The objective of this project is to promote neighbors and students that commute to become aware of what littering does to our environment we live in. Also, uniting the community closer with the same goal in mind while creating artwork that will impact the rest of the community and help spread this idea with the rest of Minnesota.

9. Paula Anderson, Robert Bower, Jamie Costello, Jake Fredericks, Anna Grunlund, Madi Haukland, Richard Ondigi, Jeremy Pettis, Courtney ConVett, and Cody Zink: Dramaturgy: LGBT and the Rocky Horror Show¹

THTR 2230, Faculty Mentor: Blayn Lemke

As a part of the Anoka Ramsey focus on including Undergraduate Research in our classes the Survey of Drama class engaged in a research project to enrich our audiences' understanding of the significance of The Rocky Horror Show as a piece of literature. This form of research is called Dramaturgy. This undergraduate research paper includes information from the following areas: (1) Cultural influences and important political events surrounding The Rocky Horror Show development, (2) Historical look at GLBT (Gay, Lesbian, Bisexual and Transgender) rights and violence experienced by the community and the consequential laws passed to either protect or diminish these rights, (3) Sex and Gender. Understanding the difference and applying these discoveries to the relationships in The Rocky Horror Show, (4) The progression of The Rocky Horror Show from small London production to a movie of Cult Film Status. This project was aided by the efforts of three additional ARCC faculty. Jim Biederman visited the Survey of Drama class and led a wonderful discussion on Gender and Sexual Identity. This discussion was a springboard to investigating terminology and better understanding the character motivation. Ed Wehling and Drew Mattson reviewed the paper, offering editing and structural suggestions. These insights were invaluable in the development of a more complete example of dramaturgical writing.

10. Tu Vu: Cleaning Up for Positive Change²
PHIL 1110, Faculty Mentor: Mo Janzen

In my Ethics class, I had to organize an activity to make a positive change in the world. Two classmates and I decided to spend two hours at the Coon Rapids Dam Park to clean out garbage also in order to help the environment. The park is the border between Coon Rapids and Brooklyn Park. A lot of people were biking, exercising, fishing, barbecuing, and having fun in the park. We walked around the park for two hours. We saw a lot of garbage lying around on the grass, under the shades where there are seats for people to barbecue, and a lot of trash along the river side. People are just too lazy sometimes to throw the garbage away. Even close to a garbage, I saw trash close to it or even next to the garbage can. On the grass, I saw bottles and cans of pops lying around, the chemicals from those drinks can kill the grass and makes it ugly. Along the river side, we picked up a lot of garbage too. I found beers bottles, plastic bags, and a lot of junky stuff. The bad thing about it is I saw trash on the water as well. That trash made the water smell really bad and was bad for the environment. I tried to take that trash out of the water so it won't get worse in the future. I also see ducks and geese eating those plastic bags and trash because they thought it was food. Those can really harm them and can cause them to die. Me and my friends tried really hard to collect as much garbage as we saw around. We did this because we thought we could help the environment of Coon Rapids Dam to be better than before and it is an ethical thing to do. In chapter one, Weston talks about acting ethically, and I think it would link to what we did at the Dam. Weston said: "to act ethically is to take care for the basic needs and legitimate expectations of

others as well as our own". Everyone that went to the park expects to have a clean park to have fun activities to do outdoor. Even animals expect to have a good living environment, they are just like human beings, they have a legitimate expectation in their environment. We also "take care" of people and animals basic needs on the environment of the Coon Rapids Dam. Even though what we did was just an "imperfect duty" because we can choose how much we did, as well as how and when we did it. But, I feel like we did a good job. We might not do it all the time, but I think doing it once in a while would still help the park's environment and keep it cleaner. We also think that we are doing charity which is provide people, animal, and environment things they need. Overall, this experiment was fun and I feel really proud of my group. I will try to do this again once in a while because I feel like it helps the environments a lot. Coon Rapids Dam is a nice place to go hangout, exercise, and have fun in general. Let's keep the place clean, so people can enjoy!

11. Kayla Bowe: Organize an Activity²

PHIL 1110, Faculty Mentor: Mo Janzen

When coming up with an idea on what to do for our organize an activity, Ashley, Summer and I were stuck. One day after class, I was talking to my mom about how frustrated I was because I had felt like I was running out of time. Suddenly, my mom reminded me of this thing we do every year during the winter. My mom calls them care kits. She puts basic necessities in a bag plus chips and a sandwich and then brings them downtown to hand out to homeless people in Minneapolis. I thought this was a great idea to do, especially since this ties in perfectly with ethics! What a perfect way for getting our Mother Theresa on! Although we had a few people criticize us while talking with some of the people we decided to help, overall it was a good, eye opening experience. In my bag, I decided to put a toothbrush set, deodorant, a granola bar, pringles, a sandwich, a few bottles of water and a few other small things! Out of all, they seemed to love the pringles. Although, I wouldn't call our actions anywhere near morally exemplary actions, I think our actions lie in the middle of morally neutral. We didn't sacrifice any comfort, or give up everything to help these people. But we did take time out of our day to help some people in need. We didn't have to, but we wanted too and the feeling after was very rewarding. Although our group tried to come up with a project that reached the goals of both charity and justice, we noticed our project aligned more along with charity due to the fact that we supplied food, hygiene products etc. whereas justice, you're promoting social change. Participating in this experience really inspired us and helped us understand ethics on a different level. Not only did it help bring to life our care ethics and give insight to the morals and values we have in an ethical perspective, but it also helped apply certain principles of different philosophers we learned about in class. Although our project didn't reach having a long term impact on the people or the community like we had wanted, we realized that it is important to start somewhere meaning it only takes one person to make a difference and cause a ripple effect which can lead to seeing differences within the community. Overall, we are happy with our project and hope that we inspire people to make a difference small or big.

12. Noelle McNeill: Days for Girls – Organizing for Equality²

PHIL 1110, Faculty Mentor: Mo Janzen

Last semester, I completed an array of activities to further my understanding of ethics. Throughout the class, I got to volunteer with my community, do research on charities, and I created my own volunteer event through an organization called Days For Girls. We made kits that go to women in poverty who aren't able to go to work or school due to their periods. At a first glance, giving women feminine products really doesn't seem like it's very effective. However, by providing these women with pads,

underwear, and soap, we are saving lives and making life more sustainable. These women can be stuck in a hut for up to a week and won't make a decent income to support their families; they fall behind in school because they can't help their bleeding. When these women receive the pads, they're able to continue on with their lives like they should be able to do in the first place. When I think of my work with the organization Days for Girls, I am reminded of an idea known as effective altruism. Effective altruists argue that we should use our resources to help the greatest amount of people. This activity positively influenced the women who received the kits we made. In fact, this project worked towards education, jobs, and equality for women; all of these things are essential to support a family while living in a developing country. The concepts I learned in Introduction to Ethics have pushed me to be a better person and to make more of an effort to help those in need.

13. Makayl Nitz: Finding Aristotle's Mean - My Experiment in Virtues.²

PHIL 1110, Faculty Mentor: Mo Janzen

During my Introduction to Ethics course, I had an assignment called Personal Change Mini-Project. For this project, I had to apply course materials to my life in a way that would better myself. I decided to study and apply Aristotle's view of virtue ethics. According to Aristotle, "virtue is the perfect middle between excess and deficit" (Weston, 176). This means that for me to be virtuous, I need to possess a specific "mean" of all virtues. One might think that to find the "mean" of a virtue would be difficult, but according to Aristotle, "the way to become virtuous, is to study a virtuous person" (Janzen, Monica). Knowing that information made the daunting task of becoming virtuous seem much easier because I realized I didn't need to find the mean of a virtue, and instead I simply needed to study someone who has a perfect balance. For my Personal Change Mini-Project, I decided to become virtuous by studying the most famous person in the world- Jesus Christ. Over the course of seven days, I studied the Bible for thirty minutes each day. I studied Jesus because I wanted to attain virtues (love, identity, and respect) that He possessed. After studying Him and His virtues, I have realized that Jesus had the perfect mean of virtues. For example, Jesus possessed the right amount of respect. If He had, had too little respect (deficit), He would've felt too small to converse with God. If He had, had too much (excess), He would've become arrogant. Jesus is the perfect example of Aristotle's view of virtue as a "mean." It is inspiring to know that Aristotle's theory of virtue ethics can be applied to everyday aspects of my life.

14. Riley Packard-Rau: Walk for Awareness²

PHIL 1110, Faculty Mentor: Mo Janzen

As part of my ethics class, I am working on an experiment where I organize an activity. I decided to take my activity a step further and see how much of a local impact I could have. I planned an open walk for awareness around the track at Spring Lake Park High School, which is co-sponsoring the walk, along with the Girls' lacrosse team. The goal of this project is to inform our community's youth about the dangers of eating disorders and mental illness, and to also spread the message of hope! Like any experiment I hope to get positive results not only at the end of this activity, but throughout the process. I am extending the impact of this activity by working with the team I coach (Girls Lacrosse team at SLPHS) as well as the wider Spring Lake Park High School Community, and even my family and friends. By reaching out to all these people, I know I am making a difference already. At the end of the day the purpose of any experiment is to make a change or discover something new. My hope for this project is to reach as many people as possible, but I will call it a success if I can only touch one life. In ethics class, we studied Care Ethics which tells us to attend to a moral problem with care and concern. As a coach, I worry about my players and hope they are all healthy and safe. I hope my project achieves some of these ethical

goals: to always attend to others with care and concern and to spread the message that no one is alone and that anything is possible!

15. Emily Dreshar and Emily Hanson: Blankets Against Chemo²

PHIL 1110, Faculty Mentor: Mo Janzen

As part of our ethics class, we are working on an experiment where we organize an activity. Our group has decided to collect fabric and make tie blankets for people who have recently been diagnosed with cancer. We wanted to provide some sense of comfort for those people who are struggling with their new found circumstances. When going through chemotherapy they often experience many different unpleasant side effects. In our experiment we hope to invoke a sense of hope in those who need it most. We hope to show those who are struggling that we care, that we are thinking of them, and that we believe in them to overcome. In ethics, we studied a variety of ethical theories. Our project was based off of the idea of care ethics, as opposed to something like utilitarianism. A utilitarian wouldn't be particularly enthused about our project because the money, time, and effort could be spent in other ways to do even more good for more people. From the viewpoint of care ethicists, however, our project is very meaningful because we aim to show empathy and compassion for those directly involved in fighting their disease. As we make blankets, we hope this gesture lets those individuals who receive them that to feel comforted and not alone. Although we are not helping many, we believe our actions are still morally significant.

16. Amber Rezac: Wings for Vets ²

PHIL 1110, Faculty Mentor: Mo Janzen

Since the start of Ethics class, I have been thinking about what matters to me and I've realized how important our country's military and veterans are. My future sister in law just joined the military and it made me realize that soldiers sacrifice a lot of time and effort into preserving our freedom. Active duty and veterans deserve medical care to help with Post-Traumatic Stress Disorder (PTSD). This problem is recognized as a mental illness, and I wanted to help Veterans Hospitals treat veterans with this condition. For my activity, I had a dinner in honor of the military and then donated the proceeds to the VA hospital. I learned that my favorite restaurant, Buffalo Wild Wings, will donate 10% of hourly profits to the cause someone is trying to raise money for. I was there for 3 hours, and as a result the restaurant donated 30% of their profits from those total 3 hours. This activity relates to many topics from my ethics class especially the concept of virtues. Confucius taught that people should focus more on others and less on themselves. By doing this activity, I'm giving to others and essentially helping them keep their medical care. This act also helps me develop my character by being more generous and kind. This is also related to utilitarianism; a theory that promotes doing the most good for the greatest number in the long term. By raising money to donate to the VA hospital, I will be providing a portion to keep the hospital running which will help a lot of people in the long term. This is important because the long term consequences would be beneficial for myself and everyone else because the hospital would stay open, and it would continue to help military members receive any clinical care they'll need.

17. Jack Knoblauch, Uny Santamaria, and Abdishakur Farah: Is Online Dating Effective in Building Relationships?²

CMST 2220, Faculty Mentor: Heidi Croatt

This project sought to measure the effectiveness of online dating. Online dating is a subject that has grown significantly in recent years and has gained some media attention regarding its use. We wanted to see if increased use of social networks to form relationships was effective in building long term

relationships. We are researching the scale of online dating and its effectiveness to form relationships and comparing that to more traditional forms of dating. There are both benefits and downsides to both online dating and traditional means of meeting, but we are comparing these different channels for dating to show the pros and cons of each. We conducted surveys regarding the use of matchmaking tools online and seek to conclude whether there is a definite answer regarding our research or whether there is more in-depth studying to be done.

18. LeiLani Wright and Margaret Steward: Pelvic Floor Treatments and Disorders³

PTAC 2050, Faculty Mentor: Lisa Lentner

The pelvic floor is made up of three layers of muscles, arranged in a funnel shape. Pelvic floor dysfunctions are a result of these muscles becoming weak and over-stretched. The good news is this is often a reversible condition. Just like other muscles of the human body, these muscles can be strengthened through exercise.

19. Aaron Dircks and John Bessel: Music Therapy³

PTAC 2050, Faculty Mentor: Lisa Lentner

Our presentation board was created in response to a research project assignment for our class. Because Music Therapy has been shown to have therapeutic affects on the human mind; we wanted to show HOW Music Therapy can impact a persons ability to help them improve in there therapy outcomes. You will see here some evidence based practice that shows Music Therapy improving things like: perception of pain and anxiety, help to motivate patients and provide enjoyment during therapy, as well as helping to increase muscle strength through playing instruments. We hope you enjoy our facts that we found and may this give you ideas for you or a loved one who is in need of improving in their therapy outcomes.

20. McCall Newbloom and Amy Vukobrat: Constraint Induced Movement Therapy³

PTAC 2050, Faculty Mentor: Penny Rivard-Sherman

A brief overview on the history, protocol, indications and contraindications for Constraint Induced Movement Therapy (CIMT). This specialized treatment approach, commonly used for upper extremity rehabilitation in post stroke patients and Pediatric Cerebral Palsy patients through task specific, forced use of the affected limb. Effectiveness of CIMT is based upon two main components: Neuroplasticity and overcoming "Learned Non-Use."

21. Anna Souther and Emily Novak: Craniosacral Therapy³

PTAC 2050, Faculty Mentor: Lisa Lentner

Craniosacral and myofascial release techniques; what they are, how they effect the body, how they're used in physical therapy treatment, and what diagnoses they benefit.

22. Derek Halverson and Dan Bachman: MedX³

PTAC 2050, Faculty Mentor: Lisa Lentner

Dan and I both completed clinicals at Brookdale Health where we had the opportunity to work with MedX machines. We specifically used the lumbar and cervical machines to help patients rehabilitate from car accidents and a number of other ailments. We were trained to perform a treatment which consisted first of testing a patients range of motion. Next, we performed a strength test, and from there we customized a training program for them to perform (on the machine) based on their strength and range of motion. Most patients are initially apprehensive when using the machines do to their

intimidating appearance, so it's our job to explain to them the incredible benefits the machine provides. What sets MedX machines apart from other machines that you might find in your local health club setting is that they provide medical testing (can test range of motion and strength), and they very effectively isolate the muscles of the neck and back. By isolating specific muscles, we can quickly strengthen weak muscles which will provide the patient with pain relief and increased function. It is difficult to only contract specific muscles when performing an exercise, but these machines accomplish this task by stabilizing other parts of the body thus preventing compensations. The efficacy of the machines have been proven through numerous case studies.

23. Bethany Peterson and Aubrey Swenson: Postural Restoration Institute³

PTAC 2050, Faculty Mentor: Penny Rivard-Sherman

This poster describes what PRI is, as well as the history and purpose behind the techniques that are used. It discusses how our bodies are asymmetrical and relates it to the functional ability of the respiratory system. Improper use of this system can cause musculoskeletal dysfunction, which is where PRI techniques are used to realign those structures. Two peer-reviewed, evidence based practice articles were incorporated in our presentation and they discuss the effects of PRI techniques on low back pain, sacroiliac joint pain, and lumbopelvic pain. Our poster also includes a list of continuing education courses available to clinicians with descriptions of each course that is offered by PRI.

24. Anastasia Safanov and Irina Tabakov: Lymphedema³

PTAC 2050, Faculty Mentor: Lisa Lentner

Lymphedema is a chronic condition characterized by accumulation of lymph fluid in the body due to malfunctioning lymph nodes. There are two types of lymphedema: Primary Lymphedema - Congenital or hereditary (abnormal formation of lymph vessels and/or nodes). Secondary Lymphedema - Injury to one of more components of the lymphatic system: blockage, dissection, fibrosis, damage, or alteration to the portion of lymphatic system. There is no cure for lymphedema and primary medical treatment includes skilled therapy and surgery in severe cases. Complete Decongestive Therapy - Includes manual lymphatic drainage, exercises, application of compression bandages, skin care, and patient education. Consists of Phase I (Intensive) and Phase II (Maintenance) Goal of phase I is to maximally reduce limb volume and normalize tissue. (Barrett, Leard, 2015). Requires twice daily treatment, but is not realistic for most patients; intensity depends on the therapist and patient scheduling. In phase II – the patient is responsible for self-management of their condition and it becomes a lifelong process with regular follow ups with Physical Therapy. Prophylactic lymphedema treatment and patient education are very important after breast cancer surgery or radiation treatments (Giles, 2015).

25. Tyler Leng, Taylor Borgman and Andrew Steward: Optimization of a BF₃ Catalyzed Biodiesel Reaction and MALDI-TOF Mass Spectrometry Analysis of a Lipid Feedstock³

CHEM 2062, Faculty Mentor: Patty Pieper

Biodiesel can be produced via transesterification of a free-fatty acid containing lipid feedstock using BF₃ in a Lewis-acid catalyzed process. This produces a renewable fuel substitute and/or additive for use in diesel engines. Waste vegetable oil and wild herb/weed seed oil are two types of low cost feedstocks for biodiesel production. Acid-catalyzed transesterification with use of simple alcohols has been shown to be a preferable method when compared to base catalysis when lipids contain free-fatty acids. A main goal of this project was to optimize the production of biodiesel via Lewis-acid catalysis and apply this optimized method to conversion of waste Camelina oil to biodiesel. Analysis of the percent conversion to biodiesel was accomplished using ¹H-NMR spectroscopy. In addition, Soxhlet extraction of Cuphea

seeds was performed and gave a 25% yield of Cuphea oil. MALDI-TOF mass spectrometry was used to analyze a portion of the lipid profile of this oil. Further studies could confirm our lipid analysis and assess the practicality of using BF₃-catalysis in waste oil conversion to biodiesel.

26. Lindsey Terres: A Comparison of Golf Course and Park Ponds on Water Quality and Macroinvertebrate Populations³
BIOL 2230, Faculty Mentor: Joan McKearnan

The leaching of the chemicals into the ground and the draining into ponds can cause numerous issues if nutrient levels are not maintained properly. The variation could mean an imbalanced ecosystem. Level changes in water nutrients make it difficult for macroinvertebrates to survive, which can be a primary indicator of the ponds health. Any perturbations in this aquatic system could cause adverse effects on terrestrial plants, mammals, and other insects that rely on the health of the water system. Abnormally high levels of nitrogen and phosphorus both common in fertilizer used by golf courses. Can cause fluctuations in pH and decreases in dissolved oxygen(DO). Will increased use of fertilizer use by a golf course effect the environmental health of ponds on the golf course? My hypothesis is that increased use of fertilizers by golf courses will have a negative effect on environmental health of their ponds. Specifically, I propose that they will increase nutrient levels, lower oxygen levels, and decrease the number of macroinvertebrates.

Three ponds will be tested on the golf course as well as three ponds in an adjacent park which will act as environmental health comparison/controls. I will take readings for nutrient levels of phosphorus, nitrogen, and DO as well as pH, temperature and turbidity readings for all six locations once a week over four weeks. Each week I will place bottle traps to collect macroinvertebrates. Dip netting will also be done once a week for additional collection of macroinvertebrates. These samples will be identified down to family and an Index of Biological Integrity (IBI) will be calculated.

27. Amberlee Hancock, Rachael Willis, Kelly Larson and Tia Kvidera: Investigating Serum IgE Levels in Endangered Mexican Gray Wolves³
BIOL 2114, Faculty Mentor: Paula Croonquist

The Mexican Gray wolf or *Canis lupus baileyi*, known as “lobo” is the most endangered subspecies of gray wolf in North America listed in the Endangered Species Act since 1976, due to its extirpation in the wild, during the mid-1900s, through a combination of hunting, trapping, poisoning and digging pups from dens. Mexican Grays have been recovered through captive breeding programs but do not seem to thrive in the wild presumably due to high inbreeding and genetic load. Several studies have shown low IgA serum levels in Scandinavian wolves presumably due to inbreeding. In addition, low IgE levels seem also to be most influenced by genetics as opposed to environmental factors such as parasite exposure. We hypothesized that Mexican Grays may produce less IgE in serum when compared to thriving Great Plain Great Wolves (GPGW) presumably due to inbreeding. We utilized wolf serum samples collected by Field Biology students at the Wildlife Science Center, our partnering institution, during their wolf handling experience, and performed enzyme-linked immunosorbent assays (ELISA) to detect IgE levels in 2 endangered Mexican Grays and 4 thriving GPGW. Our data indicates that IgE levels are lower in Mexican Grays than GPGW controls, although this difference is not statistically significant. We propose to expand this study to a larger sample size to see if this trend persists and reaches significance as this may be a disadvantage for these protected subspecies in the wild.

28. Rebecca Watry: Hydrolytic Activity of Actinomycetales Found in Intestines of Captive Wolves³

BIOL 2230, Faculty Mentor: Scott Danneman

Reintroduction of Mexican gray wolves (*Canis lupus baileyi*) into the wild has had limited success. There is increasing evidence on the critical role of intestinal bacteria in overall health. We aimed to identify and functionally characterize intestinal bacteria residing in the endangered *Canis lupus baileyi* (*C. lupus baileyi*) and thriving Great Plains gray wolf *Canis lupus nubilus* (*C. lupus nubilus*) to aid the *C. lupus baileyi* conservation effort. We hypothesized that *C. lupus baileyi*'s distal gut microbiota may be distinct and potentially less diverse than its healthy counterparts'. Identification of captive *C. lupus baileyi* and *C. lupus nubilus* intestinal bacteria was done utilizing culture - dependent isolation, genetic analysis by 16S rRNA gene sequencing and clinical analysis including zymography. Novel bacteria with hydrolytic activity were identified within the Actinomycetales order including the genera: *Knoellia*, *Janibacter*, and *Streptomyces* only from *C. lupus baileyi*'s isolates. Future studies may show differences in greater detail and determine if the microbiome's differences are contributing to *C. lupus baileyi*'s inability to thrive in the wild.

29. Joseph Shoulak: Dice and Sample Spaces³

Math Independent Study, Faculty Mentor: Mark Omodt

Say you're playing a board game with your friends, and you want to select one of 5 enemies at random, but all you have a 6-sided die. How would you do this? What if you want to choose a random card from a deck, but all you have is a coin? This paper answers those questions by proving theorems allowing you to relate most sets to all others, and along the way we will discuss dice-rolling examples and random-number-generating algorithms similar to the one used by the programming language Python.