SeaPerch Project: Tom Carstens. This fall in EGR 105, we introduced a new project designed to provide our first year engineering students with a hands-on experience that incorporated electrical and mechanical components. Our students worked in groups of 2 to build underwater remotely operated vehicles – SeaPerches. The SeaPerch program is used by the Navy to attract students to the field of Engineering. The design is elegantly simple. A basic box frame is built from ½” PVC pipe, and three waterproofed thrusters are attached to this frame with cable ties. Buoyancy is provided by pool noodles. Power is supplied to the thrusters through a 50’ cat5e tether which is attached to a control box. The control box allows the operator to independently control each of the three thrusters. The control box is attached to a 12v battery which powers the vehicle. Our students completed all the work themselves using basic hand tools. This work included cutting the PVC pipe to length, drilling drainage and thruster attachment holes in their frame, soldering and testing the circuit board in their control box, waterproofing their motors, connecting the motors to the tether, and adjusting the buoyancy of their vehicle so that it could properly navigate underwater.

Perturbations Observed in the Orbital Elements of the Spectroscopic Binary 57 Cygni: Kenneth McLaughlin, Zachary D. Jeffries. We present spectroscopy confirming repetitive Doppler-shifts and photometry confirming no eclipses in the double-line spectroscopic binary 57 Cygni. Our spectroscopy is limited to a range encompassing H-alpha and the helium 667.8 nm line. Doppler-shifts of both stars were well-resolved in the helium line but less so in H-alpha. Although we find the radial velocities derived from both lines reasonably consistent we retained only the helium-line derived velocities for sinusoidal curve-fits to the orbital dependence. The fit-amplitudes specify the ratio of the stellar masses as 1.03 +/- 0.05, a ratio that is in agreement with previous assessments. We find an eccentricity of 0.028 +/- 0.024 and a longitude of periastron of 163.5 +/- 2.5 degrees; the former is significantly lower than that previously reported while the latter is in agreement but calls into question the apsidal motion predicted four decades ago. Our modeling suggests the presence of an external third body was implicit in this reported apsidal motion, as well as the most likely mechanism for our observed variation in eccentricity. Based upon the spectral type assignment, the near-circular orbit and the established mass ratio, we can place restrictions on the orbital inclination from 51.5- to 53.0 degrees, in reasonable agreement with previous estimates.

From catalog to Discovery: Heidi Pettitt. This summer the Library will transition from our current, antique book catalog to a new, modern discovery system. This new database will allow everyone to search multiple article databases, including JSTOR and EBSCOhost, the book catalog, and eBook collections at the same time. In addition to searching more materials at once, the system has many enhanced search features such as filtered searching and ability to search multiple college libraries at the same time. The new catalog will also be mobile.
friendly, allowing users to access it wherever and whenever they want. We would like to set up a demo site during Legacy so that interested students, faculty, and staff can take a look before it gets rolled out for the Fall semester.

**Educación para los inmigrantes de Sudamérica o América Central: Alex Earles.** Recently, there has been an influx of Spanish-speaking immigrants from South and Central America into the United States; therefore, many Spanish-speaking children are entering the school system. These students often struggle due to familial cultural barriers and lack of institutional structure within the education system. By identifying biases and stigmas towards Spanish-speaking immigrants, I am able to learn how these affect the quality of education the students receive and the cultural competency of others, such as teachers, in relation to these students and their families. I examine articles concerning topics such as transnationalism, the importance of communication between home and school, and challenges facing first versus second generation immigrants in the United States and then discuss the aftermath of factors, such as these, on the students' education. This research addresses the problematic perspective that many school systems have, which is seeing non-English speaking students as a burden, and therefore not allocating resources to help further their education. This message that the institution is emanating, consequently is making these students feel as though they cannot attain a higher level of education in the future. If this institutional flaw is not attended to by our nation, the benefits that these immigrants could have offered economically and socially will be realized. 

(Mentor: Kate A. McCarthy-Gilmore)

**Development of a Coarse-Grained Force Field for Phosphoprotein Simulations: Alexis M Hanson.** Application to LAT and Tau Proteins.

Phosphorylation of proteins is critical to their activation and function. It is an important and abundant process in the cell with over one-third of proteins being phosphorylated at some point in time. The phosphorylation of the LAT is critical to immune response, and the phosphorylation of Tau is critical to stabilizing signal transmitters in the brain. An addition to a course-grain computational model used to simulated proteins is developed to represent phosphorylated amino acids. This model is applied to the LAT and Tau proteins to understand large scale structural changes of these proteins when phosphorylated.

(Mentor: Adam T. Moser)

**Replication at Loras College of Griskevicius, V., Tybur, J. M., & Van den Bergh, B. (2010): Alexis O'Neill, Kaitlyn M. Kulas, Emma A. Walsh, Alisha I. Payne.** We are replicating Griskevicius, Tybur, & Van den Bergh (2010) with the hypothesis that desire to demonstrate status will heighten desire for green products when green products cost the same as non-green products. Participants will read one of two stories, one aimed at status and the other without a motive and then be asked to make three choices between products. In each choice one product will be "green" or environmentally friendly and the other "non-green". We hope to recruit 90 participants for this study. We are planning on using the same statistical analysis like the original study which will be chi-square analysis comparing each product choice followed by a one-way ANOVA with the dependent variable being the composite choice. The independent variable will be a type of story (status or control) read by participants. We anticipate that participants whose need for status is activated by the story will be more likely to choose the pro-environmental products. We have conditional approval by our IRB and are waiting on full approval and anticipate beginning our data collection in February. If we succeed in replicating the initial study, our findings would provide additional evidence
that an individual’s desire to demonstrate status could be employed to promote pro-environmental behavior. (Mentor: Julia S. Omarzu)

La Independencia: Fighting the Influence of Franco: Allison Klimesh. Throughout his almost thirty-six years as the dictator of Spain, Francisco Franco sanctioned innumerable acts of violence committed against the Spanish people, including unlawful deportations, forced labor, countless rapes, outright murders, wrongful executions, and the perversion of Catholic identity and values, all in order to force the diverse regional cultures from across the peninsula to conform to his ideal, nationalist Spain. This suppression was especially detrimental to the regions of Galicia and Cataluña, which each boast a history, traditions, and language unique to Spain. Despite Franco’s influence, today, both Galicia and Cataluña have retained distinctions, and these differences are in fact fueling the independence movements that are fighting for separation from Spain. By using historical records and articles to examine the spirit of these regions before and after the influence of Franco, I hope to clarify how much of a role—if any—his oppression plays in their modern-day fight for independence. I will explore the differences in the use of their respective regional languages in various novels, poems, plays, and other cultural works to question the role that cultural production has played in the fostering of their regional identities. Finally, I will also look at the varying factors that cause the difference in success and support between the movements in Galicia and Cataluña. (Mentor: Kate A. McCarthy-Gilmore)

The History and Economics of Minimum Wage: Alyson Watson. Minimum wage is a controversial topic today in the media and has been highly scrutinized. However, people have forgotten the original purpose and history of minimum wage. I will be utilizing a non-quantitative analysis of the history, its implementation, and the economic theory behind minimum wage. By researching the history of this law I will be able to demonstrate its original intent and how it was actually implemented. This including the idea mentioned by many other researchers that political influence implemented the law rather than congress by itself. Along with this I will look into whether there are other external aspects that are hindering the effect the minimum wage was intended to have. By using basic and intermediate economic theories I will analyze the economic impact of having a minimum wage law, and whether or not minimum wage is efficient in the United States. (Mentor: Jennifer J. Smith)

The Economics of Inequality: Alyson Watson. This guided research attempts to analyze the economics of inequality across more than one school of economic thought. Two major schools of thought included in this research are Classical and Marxian Economics. While both have very opposite and conflicting views on inequality I believe that the causes of inequality will be similar. The difference between the two shows when looking into how inequality should be dealt with in society and whether it is natural to exist. This research project developed from a History of Economic Thought course and has expanded to include full works by economics rather than snippets of writings. The goal is remove bias that comes from outside sources, and look into the actual words behind the theories and data that we learn or hear today. This could be valuable to future research by being expanded on in terms of how to measure inequality effectively and how much inequality actually exists within different societies. (Mentor: Jennifer J. Smith)
Critically Appraised Topic: Treatment of Alopecia Areata: *Amanda Mauss.* This Critically Appraised Topic looks at the effects of a topical treatment versus an aromatherapy treatment in treating hair loss in patients diagnosed with Alopecia Areata. Patients with Alopecia Areata suffer from patchy or complete loss of hair. Although hair loss is not life or death, children and the female population may struggle with a variety of psychosocial issues, including embarrassment or harassment. Three research articles were analyzed, all of which received an 8/11 on the PEDRO scale. The studies included were all prospective studies looking at either topical treatment, aromatherapy, or comparing the two. The research concluded that both the use of aromatherapy and topical treatment were successful in treating the hair loss associated with Alopecia Areata. This is a relatively new subject in research and there are many different treatments that are being studied. The two therapies in this Critically Appraised Topic were both safe and well-tolerated for the treatment of Alopecia Areata.  (Mentor: Nathan D. Newman)

Effectiveness of Joint Mobilizations on Athlete’s With Chronic Ankle Instability: *Amy Gladis.* Chronic Ankle Instability, or CAI, is usually classified by weakness, or “giving way” while walking or participating in other activities. Chronic ankle instability is common in athletes who have sustained one or more ankle sprains or other ankle injuries. This critically appraised topic investigates joint mobilizations as a therapy technique to help provide the injured ankle greater stability and strength. Research suggests that joint mobilizations help improve range of motion and reduce pain in patients with chronic ankle instability. However, current research is limited to support that the effects of joint mobilization are sustained over a long period. Additional rehabilitation techniques are necessary for the manual therapy of joint mobilization to have lasting results on improved ankle stability and strength.  (Mentor: Molly M. McDonald)

Denaturation of Cancer related TIAM 1 PDZ QM Peripheral Protein via Urea: *Andrew Reed.* The protein structure of TIAM 1 PDZ QM was analyzed to better understand the integrity of the Domain PDZ. TIAM 1 interacts with RAC 1 which functions in cellular growth, cytoskeletal reorganization, and many more important functions. The PDZ domain is thought to have an interaction that affects the function of RAC 1. The chemical denaturant Urea was used in a stepwise fashion to observe the changes in the structure from completely natured to denatured. This chemical interaction was analyzed using HSQC Nuclear Magnetic spectroscopy, which creates a 2 dimensional spectra of the 94 amino acids that make up the PDZ domain. The spectra obtained from a 2 mmol addition to the PDZ sample showed no denaturation of the Domain. The concentration of Urea was then increased to 4 mmol in the sample. This caused a complete denaturation of the sample. These results allowed for no interpretation of the stability of the structure of the PDZ Domain do to the denaturation occurring to quickly.  (Mentor: David C. Speckhard)

The Effects of Mild Traumatic Brain Injuries Later in Life: *Ashley McGee.* Alzheimer’s and dementia are often associated with mild traumatic brain injuries that have occurred while playing sports. The research suggests that mild traumatic brain injuries do increase one’s risk of developing early onset Alzheimer’s or dementia later in life. Although there is no guarantee one will develop either disease people who have sustained a mild traumatic brain injury are at greater risk. The findings suggest that mild traumatic brain injury is a specific risk factor for Alzheimer’s disease and dementia yet it cannot be determined how it affects the onset of the disease.  (Mentor: Nathan D. Newman)
Standard eye tracking is expensive and lab based (e.g., head restraint). Although, it has shown to be of high accuracy it is not ideal for testing in the real-world. However, new low-cost tracking is now making eye tracking more accessible and mobile. Previous research (Dalmaijer, 2015) indicated that both the EyeTribe and the EyeLink ($40,000 high quality eye tracker) had similar spatial precision and accuracy, region of interest and pupillometry analysis abilities. However, this research was conducted in a standard lab based environment (i.e., sitting with head restrained), in the present experiment we tested the low-cost tracker (EyeTribe) in both a standard and “mobile” (i.e. standing/holding tablet) conditions in hopes to validate its potential use outside the lab (e.g., sideline assessment of athletes). We found no significant difference between the standard lab testing condition and “mobile” condition on measures of accuracy and precision, region of interest and pupillometry analysis. This provides strong reasoning to move towards the use of this device outside of the lab, for example in conjunction with sideline concussion assessment, to provide physiological feedback along with the current subjective and cognitive testing. (Mentor: Jake C. Kurczek)

Community Policing Effectiveness: Austin Jacobi. Understanding the new age of policing in our society is critical in maximizing public safety and community effectiveness. Law enforcement agencies are expected to find new and innovative ways to protect and serve their communities, keeping themselves and community members safe. Using data from the Police Public Contact Survey (PPCS), I will analyze how community policing efforts are perceived by survey respondents. The PPCS interviews a nationally representative sample of U.S. residents age 16 or older as a supplement to the National Crime Victimization Survey. Expected findings are that when community policing techniques are used, public perceptions of police will be positive. (Mentor: Kathrin A. Parks)

Music Machine: Ben Friedman, Tyson Morrison, Mike Sullivan, Tyson D. Morrison, Michael A. Sullivan. Our Music Machine robot was designed to keep the jams bumping while you’re on the move. Our robot played music from a speaker attached to the robot, while wheels and sensors on the robot kept it moving and prevented it from running into anything. This robot used an Arduino as the main controller. Two motors were used to power the wheels, and a chassis brought the drive, sensor, and sound systems altogether. (Mentor: Kristen A. Thompson)

The Effects of Living in a Non-traditional Family: Benjamin Kindle. Using data from the 2014 General Social Survey, this study will examine the impact of family structure on various life outcomes. More specifically, I will analyze how a respondent’s family type when they were 16 impacts their marital status, job satisfaction, and socioeconomic status. I predict that non-traditional family status will negatively impact each of these factors. (Mentor: Kathrin A. Parks)

Effect of Density on Oviposition Behavior in Drosophila melanogaster: Brooke Prososki-Green. Oviposition site preference in Drosophila melanogaster is vital for the survival of a fly’s offspring and is the influenced by many factors. Flies are known to prefer sites containing citrus fruits because wasps that parasitize fly larvae are repelled by the smell of citrus. Flies also show a strong tendency to aggregate...
their eggs even though they may face increased competition by doing so. It is possible that this aggregation behavior may be associated with flies identifying the best oviposition sites in an area by detecting where other females lay their eggs. Oviposition behavior of Drosophila melanogaster was tested in response to fly density and oviposition site quality. The total number of individual eggs laid, the amount of aggregation (measured as variance : mean ratio), and their choice between grape and orange media were observed. We found that increasing density significantly decreased (p< 0.001) the number of eggs females laid, but significantly (p< 0.0001) increased their tendency to aggregate their eggs. Lastly there was no effect of density on the ability to choose between orange and grape media. In conclusion, the density of flies has a significant effect on Ovipositioning behavior. (Mentor: Fred B. Schnee)

**Quadcopter: Bryan Hermann, Zachery T. Lindstrom, Jonathan W. Powers.** Our project consists of a redesign of the current quadcopter that was built during the 2013-2014 school year. The redesign of the quadcopter will use 3D printing to build a newer model. 3D printing the quadcopter will produce a lighter model, more efficient design process, and a visually appealing model. The focus of the project will be to use the quadcopter to get a view of places that are dangerous for humans to be. Places such as the top of burning structures, breathtaking viewpoints, and other typically dangerous areas where a drone can be sent in to prevent endangering human lives. An easy to use drone is becoming more vital to the changing world. (Mentor: Kristen A. Thompson)

**PLA Tensile Test: Bryan Hermann.** The materials used throughout the world have been tested again and again to find the exact strength of each material. Most of the material known to man has been involved in these tests. 3D printing is new to the science industry, and to Loras College. 3D printing at Loras College use PLA plastic with unknown limitations on the prints. The experiments done during this time will create data for Loras to use. The design team will be building a quadcopter that will be printed mostly in PLA plastic until the final design stages, in which some of the parts will be printed in other materials. Building a project from PLA plastic gives some incentive to determine the strength of the material and determining the limitations of this material. The tensile strength data that will be conducted will be used to compare the experimental results with the simulated results in Solidworks. The MakerBot 3D printer used has different setting adjustments in order to change each print. Infill is the percentage of the inside of the print that is filled with PLA. The number of shells determine how many outer walls the print will have. I tested the effects of infill and shell count in order to determine which feature has the largest impact on tensile strength. After looking at the data recorded, it can be concluded that a decrease in infill is directly proportional to a decrease in tensile strength. Shell count is also directly proportional to the tensile strength, but with much less of an impact than infill percentage. (Mentor: Kristen A. Thompson)

**Localization of a PCH Protein and Actin in Dictyostelium using Confocal Fluorescence Microscopy: Cal Stovie.** Dictyostelium discoidium is a soil-living, eukaryotic organism. Dictyostelium migrate and can form multicellular structures that move as a unit. Actin-binding proteins are involved in signaling behaviors of the cell by interacting and regulating the cytoskeleton. The PCH family proteins have been observed to play a role in actin reorganization in the presence of a chemoattractant. PCH family proteins are known to be involved in cytoskeleton reorganization. PSTPIP1, a PCH family protein, has been associated with manipulation of actin in some cell types. This research investigated the effect of overexpression of PSTPIP1 on actin during chemotaxis and slug formation in Dictyostelium. Confocal
fluorescence microscopy was used to quantify abundance and cellular distribution of actin. Further research, including knocking out the PSTPIP1 protein, will need to be done to fully understand its role in Dictyostelium chemotaxis and slug formation. (Mentor: Kate M. Cooper)

**Green Gold or Fool’s Gold?: Calvin Harridge.** An economic analysis of Colorado’s legalization of marijuana. This analysis focuses in on the legalization of marijuana. Colorado is the main focus due to the steps that have been taken to be the first state to decriminalize recreational marijuana. It provides the nation with a testing ground for regulation and enforcement. In the study there will be a focus on looking at the projected effects of legalizing marijuana versus the actual outcomes that have occurred. The topics that will be examined are the taxes generated, the drug markets, criminal offenses, health effects, and other similar variables. The results from the research will determine if there is an economic benefit or loss from the legalization of marijuana. The data used in the study will be taken from the state websites that have comprehensive reports on the subject as well as academic journals that outline the effects of legalizing drugs. This is important, because many states are now considering following Colorado’s decision and legalizing recreational marijuana. This will give them insight on what the actual economic outcomes are from Colorado. It will provide other states with information on how to differ or remain the same from Colorado. (Mentor: Jennifer J. Smith)

**Multidirectional Instability: Christine Hughes.** Multidirectional shoulder instability (MDI) consists of instability in two or more directions. Traumatic anterior dislocation is most commonly due to the anatomy of the shoulder (Kiss, J, et al. 2000). This ball and socket joint provides multiple movements relying on stabilizing muscles to prevent dislocation. MDI has increasingly been studied to find the best treatment, in spite of incongruent facts and opinions on the treatment. Shoulder instability is difficult to treat since it is so complex, but many doctors believe in treatment with rehab and then surgery if necessary (Kiss, J, Damrel, D, Mackie, oland A and Neumann, L. 2000). Doctors also believe quick diagnosis and treatment are important (Trevor R. Gaskill, Dean C. Taylor and Peter J. Millett. (2011). This is important in athletes in overhead sports, who are more commonly diagnosed with MDI (Bak, Klaus. et al. 2000). This literature analysis determined that a patient between sixteen and sixty-five with MDI must act immediately with rehab or an arthroscopic capsular shift as a surgical treatment option. If surgery cannot be performed immediately, rehab should begin until the surgery date. This literature analysis investigated outcomes of surgical and rehab treatment options for athletes undergoing MDI shoulder treatment. (Mentor: Nathan D. Newman)

**Effectiveness of Joint Mobilization Techniques in Comparison with Active Rehabilitation in Restoring Joint Arthro-Kinematics in Patients with Chronic Ankle Instability: Colin R. Ensminger.** The critically appraised topic reviews the effectiveness of joint mobilization rehabilitation techniques when trying to restore joint arthro-kinematics in patients who suffer from chronic ankle instability when compared to active balance rehabilitation exercises. Chronic ankle instability can be associated with altered gait mechanics as a result of injury, which can cause alterations in neuromuscular control and gait mechanics. Both techniques of joint mobilization and active balance rehabilitation have proven to be effective when restoring the injured joint to normal function. This review found three studies that met the inclusion criteria, which was an 8/10 on the Pedro scale. All included studies were randomized control trials, however two of the studies had
threats to validity due to the methodology as well as self-reporting bias of the subjects. Two of the studies found that joint mobilizations were effective as rehabilitative techniques for chronic ankle instability. One study found that active balance rehabilitative exercises were also effective. There was no significant difference between the two techniques as far as which treatment works better than the other.

(Mentor: Molly M. McDonald)

**Paris of the West: J-term Business Seminar Experience:** Elizabeth Fischer, Alexander C. Liddell, Calvin T. Miller, Collin J. Long, Jenna M. Walleser, Joseph D. Shealy, Kevin R. DeLaMar, Maddison M. Theisen, Rachel M. Moser, Ryan T. Smith, Ryleigh J. Keeney, Therese A. Schultz. During J-term as a group of 12 business students we traveled to California for our Business Seminar class. A Loras Alumni and Board of Regents member, Rich Clayton, hosted us in San Francisco and introduced us to a variety of businesses and business leaders, and provided us with opportunities to network. We also participated in an online business simulation throughout the three weeks. It was a comprehensive opportunity for us to put into practice what we have learned during our four years. The simulation was competitive and team based. The simulation in basic terms was where we were in charge of running a computer business. We would like to share what we learned from our simulation and business tours in a poster presentation. We also would like to share the cultural part that was included in the trip. Since we were able to visit Napa Valley, Muir Woods, the Golden Gate Bridge, Pebble Beach and Alcatraz. We will include pictures, testimonies, and data from the simulation. (Mentor: Hugh Graham)

**eDUcation Club takes on Des Moines:** Emily Erickso, Abigail L. Unsen, Nora E. Kehr. Members of the Education Club travelled to Des Moines to discuss education topics with the Iowa legislators. We happened to be there at the time the collective bargaining bill was being debated. This was a very hectic time, but we had the opportunity to talk to Senators and Representatives about our views on the bill. (Mentor: Hilarie B. Welsh)

**The Use of Digital and Nondigital Resources in Developing Language and Literacy Skills in English Language Learners:** Emily Pollpeter. The language experience approach is an evidence-based method used frequently with English Language Learners in order to help them develop their English oral language and literacy skills. Throughout the spring of 2016, I worked with a 3rd grade male Marshallense student in the Dubuque area to help begin the process of helping him become more proficient in the English language. The language experience approach along with a variety of meaningful digital and non-digital tools were used to help the student succeed in his work. By the end of the spring, the student was speaking in English sentences and had completed creating two of his own “books.” The time spent working with this student is proof that the language experience approach, digital resources, explicit and scaffolded instruction do help an English Language Learner student become more proficient in the English language. (Mentor: David M. Salyer)

**Effectiveness of Aquatic Therapy on Reducing Fatigue in Patients with Multiple Sclerosis:** Emily Sundstedt. This critically appraised topic investigates the effectiveness of aquatic therapy in reducing debilitating fatigue in Multiple Sclerosis patients. MS is an autoimmune disease in which the immune system slowly destroys the peripheral nervous system in the body. Patients with MS often report having
excessive fatigue. Various methods of rehabilitation, including aquatic therapy, can be used to alleviate symptoms in those with MS. Three high-quality prospective research articles were analyzed to assess aquatic therapy for MS patients. Overall, research indicates that aquatic therapy may be used to decrease pain in patients with MS, but more research is needed to determine if aquatic therapy effectively decreases fatigue. Although evidence on the effects of fatigue is limited, there is enough evidence of reducing pain in MS patients that aquatic therapy should be recommended. Aquatic therapy poses few risks to the patient, and when the facility is available, it can be incorporated into therapy.  

(Mentor: Molly M. McDonald)

The Effect of Early Environmental Stress on Corticosterone Levels in Mice: Erin Weaver. This project examines whether inducing stress in the first few days after birth will affect the corticosterone levels in mice during adolescence and whether these differences in corticosterone levels affect different behaviors weeks after birth.  

(Mentor: Jake C. Kurczek)

The comparisons of being a professional wrestler that is an independent contractor for the WWE to being an employee: Gino Orlandi. The WWE has signed their wrestlers to independent contractor contracts ever since the corporation was established. I will do economic research on whether the WWE’s or the wrestler’s income or expenses will be affected if the wrestlers were hired as employees instead.  

(Mentor: Jennifer J. Smith)

Death in Dubuque: Center for Dubuque History Website: Jacob Richert. Our project is creating an efficient, interactive website that clearly portrays the information in the Center for Dubuque History and is effective in promoting the use of local Dubuque history in a classroom setting. Initially the website will have data on Dubuque’s 1918 influenza epidemic, but it will be expanded upon by the Center for Dubuque History and, hopefully, future honors projects. Last semester we focused on researching the epidemic and meeting with the center to plan the project. This semester we are planning how to design the website by looking at good examples of informative websites, what makes a website easy to access, and what is easiest for Mike Gibson, who runs the Center of Dubuque History, to edit and add onto. Next school year we will create the website and upload the influenza data. Our senior year will be focused on community outreach. We intend to help create lesson plans that will incorporate the website to teach local history.  

(Mentor: Kristin M. Anderson-Bricker)

Trash Collector Robot: Tyler Havens, James L. Reese, Patrick C. Mikel. Our design is a robot that will serve peoples lazy need of not wanting to get up to go throw away their trash. The robot will be controlled by the user with a remote to pick up or take your trash to the trash or recycling bin. The robot will decide for you if the trash needs to be recycled or not.  

(Mentor: Kristen A. Thompson)

El Camino de Santiago an its development from religious to secular experience: James W Rubino. The Camino de Santiago has been a religious experience tied to the Catholic Church since the 9th century but has developed into a wider secular meaning in the 21st century. This project will examine if the religious identity of the Camino has been reshaped by the establishment of the Camino as a
space for tourist activities. In addition, a consumer culture has been derived from the original religious intent and involved a construction of a non-religious identity. While looking at whether the secular and religious identities are able to exist together or separately and how the space created is different for pilgrims on the Camino de Santiago compared to being in the city of Santiago implies different perspectives by every individual. Being considered a pilgrim can be seen as a time of spiritual or personal growth as they are being welcomed to the country of Spain. I will use case studies, spatial theory, newspaper and scholarly articles, and personal experiences from the Camino. This research topic hopes to understand the differences and impact of the religious and secular identities of the Camino de Santiago and the factors that motivate individuals to complete the Camino. This investigation seeks to explain the reasons that has caused this sacred pilgrimage to develop into different secular and religious aspects. (Mentor: Kate A. McCarthy-Gilmore)

1986: The Collision of Sports, Politics, and Pop Culture: Jamie Engelke, Joseph A. Lyon, Andi F. Leineberg, Grant A. Wiederin. The goal of our project was to give an overview of 1986, a year that would change the world, particularly through sports and politics. The presentation needed to have events within it that dealt with sports, politics, pop culture, and other major happenings of 1986 that left a lasting imprint on our society. After preliminary research, the events were divided up between group members and extensive research was done on the individual topics that the group members felt most exemplified the impact on society that continues to remain influential today. A formal presentation was then made to our class about the happenings of 1986. (Mentor: Matthew J. Garrett)

The Importance of Internships: Jasmine Sronkoski. Through the Bachelor of Arts program for Criminal Justice and Social Work, I had the opportunity of being an Intern with the Dubuque Rescue Mission. This organization is an all-male homeless shelter in downtown Dubuque. The role with The Mission was to be present in all areas of their work and assist in necessary ways. Daily tasks ranged from serving meals, attending group meetings, and refining the online filing system. An important aspect of this internship experience was forming relationships with the residents and staff within The Mission. These relationships helped create an environment for all members of The Mission to feel welcome, important and relevant to the success of The Mission and the well-being of all members. After The Mission, I then transitioned into the life enrichment intern with Sunnycrest Manor, a nursing home in Dubuque. Working with a small staff, our role was to enrich the lives of residents through activities, outings, and one-on-one visits. This internship was specific to my social work major, as the focus was at the micro level working with individuals and smaller groups. I gained much insight from this internship regarding my personal skill set and the numerous resources available to the Dubuque community, specifically for the aging population. This internship was important in the development of my micro skills. (Mentor: Nancy Z. Fett)

Developing A Coarse-Grained Force Field for Phosphoprotein Simulations: Jason Derby. Computer simulations are an important tool in understanding complex biological systems like disordered proteins or even entire cells. In collaboration with the University of Iowa, we had added the role of protein phosphorylation to an existing coarse-grain model used to study protein motions. Including phosphorylation to the model is key to many protein functions. This addition to the model is tested on the LAT and Sic1 proteins. (Mentor: Adam T. Moser)
Project Black Hole: Jeanie Kasper, Nicholas F. Spiess, Evan J. Weaver, Luciano K. Ricotta, Jonathan B. O’Brien, Jacob T. Formella, Dallas J. Clasen, Logan C. Kubovec. Project Black Hole created a functioning prototype to measure and analyze pupil size for disease diagnosis. The handheld device will be affordable and used globally as the new standard in doctor offices and emergency rooms. It is able to quickly and precisely measure the diameters of a patient’s pupils in light and dark conditions to test for Anisocoria (a disorder where one pupil is larger than the other). This condition can be indicative of a number of serious conditions that require immediate medical attention. The prototype uses a combination of hardware and software to capture an image and measure the diameter of the pupils. The medical professional can operate the device through a graphical user interface, thus requiring little training to utilize the apparatus. The next step for the project is to prepare the design for manufacture and begin to save lives.  (Mentor: Danial J. Neebel)

Multicultural Education J-Term: Jenna Prier. This poster presentation provides insight into my Multicultural Education J-Term Class. Topics in the poster presentation include course context, experiential learning in Dubuque and Sarasota, FL, and school choice. In this presentation, I will talk about the contrasting benefits and flaws of school choice. I will also talk about the factors that make up multicultural education.  (Mentor: Hilarie B. Welsh)

Feminicide and the Role of Drug Violence in Mexico: Jennifer Medina. Feminicide, the abuse and/or murder of women based on their gender, is a global issue that stems from the systemic gender-based discrimination in which men are seen as superior to women. In my research, I will specifically focus on the country of Mexico in order to find the social causes and what allows this violence to continue to exist in this developed country. In many cases, forms of violence are institutionalized and permeated through societies and different cultures, and often times have connections to other issues in the economic and political realm of that specific area, such as poverty or corruption. Such issue is the impact of illegal narcotics on this violence. In Mexico in particular, the narcotic industry makes women more susceptible to this violence because women become part of the “territory”, they are objectified and therefore are used as pawns in the selling and trade of narcotics. I will examine the violence against indigenous women and the role they play in the narcotic industry, compared to non-indigenous women of Mexico to see if there is a hierarchy of injustice within and what that says about the value of the woman based on her cultural background. Often times, the occurrence of feminicide is directly related to the cultural background of the woman. In this research I will look at not only the organizations aiming to help victims of this violence, but the women themselves, and the resources and tools they use to demonstrate their own equality within their society in order to offer directions for future help and what needs to be done in order to help alleviate this violence. (Mentor: Kate A. McCarthy-Gilmore)

Propulsion Analysis and Printer Tolerance Verification: UUV Propeller Testing: Jesse Anderson. Determining the proper propellers to use are key in creating ideal thrust for variously designed unmanned, underwater drones (UUV’s). Many variables need to be taken into account when designing marine propellers. These include (but are not limited to): shape, weight, buoyancy, motor/engine output, and size. It can also be stated that when the optimal propulsion system is identified, the longevity of the power source is increased and yields a more reliable run time. Therefore, by analyzing and comparing the thrust (force) generated by variously oriented propellers, it will be possible
to determine the proper propeller design parameters to implement in the overall UUV design. At separate times the various propellers will be attached to the motor via an aluminum shaft and submerged in water and hang from a suspended spring force gauge. Along with physical data, simulations will be run using the Flow Simulation tool found within SolidWorks. Upon recording and analyzing the gathered force data, the most efficient and powerful propeller will be determined and implemented on the final design of the UUV.

Another aspect of this research includes determining the quality of prints (tolerances) the MakerBot Replicator is capable of producing. (Mentor: Kristen A. Thompson)

**Unmanned Underwater Vehicle: Jolene:** Jesse A. Anderson, Michael W. Krol, Marshall W. Jackson. The purpose of this project is to create a search and rescue drone and/or a recreational drone, equip with live-feed video, gps, and Sonar applications. It is also well known that the market for unmanned underwater vehicles is growing at a staggering rate, due to advancing technologies and a cheaper market - ranging anywhere from two hundred to twenty thousand dollars. By utilizing the skills of various engineering techniques acquired at Loras College, including various software, electrical, mechanical, and design processes, it will be possible to demonstrate our advances and capabilities as engineers. The drone hull will be constructed entirely of 3D printed PLA plastic, which will house water sensitive internal electrical components. The UUV group plans to use three identical brushless DC motors; two of the brushless DC motors will be placed in the rear of the drone for forward and reverse thrust, and act as the steering mechanism. This works much like a tracked vehicle. In the center of the drone, a vertical brushless DC motor will allow for the drone to change elevation/depth. Upon completing extensive research and numerous designs, the optimal product will be tested, analyzed, and improved.  (Mentor: Kristen A. Thompson)

**Life Skill Employment Trends in College Athletics:** Jessica Dickhut. College administrators, coaches, players, and academic advisers search for ways to better prepare student-athletes for their lives after college. One method that had be expanded is the development and implementation of life skills programs within collegiate athletic departments. The NCAA developed a life skills program in 2005. In 2016, the NCAA partnered with the National Association of Academic Advisors for Athletics to oversee the operation of life skills programming for student-athletes. The purpose of this study is to examine the trends in life skill employment opportunities and job duties. A content analysis will be completed on job descriptions for life skills positions from the previous ten years. Specific factors examined will include years of experience, compensation, number of positions, specification of duties, and educational requirements. (Mentor: Anne C. Marx)

**The Effects and Probability of Drug Use for Minorities:** Jonathan Catalan. This research examines the effects and probability of drug use for minorities. Analyses include the relationship between parents, teenager and drug and alcohol use. This research examines data from the Boystown Study of Youth Development available on the ICPSR database. Questions include: Does the relationship between minority teens and their parents have an effect on drug and alcohol use? Do minorities have a higher probability of using drugs and alcohol? Variables include; age, GPA, jobs during school, drug use of parents, and importance placed on school work and grades. An anticipated
outcome is that a correlation exists between parent relationship and drug and alcohol use. It is also expected that this relationship will be mediated by efforts to cope with difficult life events.  (Mentor: Valerie R. Bell)

**QuadCopter Propellers: Jonathan Powers.** Designing of a QuadCopter of a team of 3. My task was to test different propeller designs and to research different options for which we can use for our QuadCopter.  (Mentor: Kristen A. Thompson)

**Basketball Analytics: An Opportunity for College Internships: Jordan Stiefel, Philip S. Rhodes.** Sports analytics has gained popularity in part to the success of the film Moneyball, a motion picture depicting the attempt of a MLB general manager’s to reinvent his ball club by outmaneuvering wealthier teams. In addition to professional sports teams, colleges have implemented analytics into their athletic programs. Higher education institutions that offer degree programs in business analytics have a unique opportunity for college sport programs, as well as, students. The purpose of this study was to examine an internship of a business analytics student with a college basketball program. Analytics was implemented into a men’s basketball team in the 2016-2017 season. A selection of categories was examined to better predict the success of a team. Ultimately, analytics was used to help determine player lineups, game-play strategy, and overall efficiency. Best practices for athletic administers to implement sport analytic internships are based on the philosophy of higher education to create lifelong learners.  (Mentor: Anne C. Marx)

**Effectiveness of Plyometric Exercises in Muscle Strengthening and Returning Proprioception in Rehabilitation Programs: Joseph Pagura.** This critically appraised topic studies the effects of plyometric exercises when used in rehabilitation programs and if there is any correlation in regaining proprioception in post injury situations. One of the major keys of returning a sense of proprioception or balance to the affected joints is increasing muscle strength around the joint. Plyometric exercises can be a good tool during the rehabilitation program at any point. Three high-quality Prospective research studies with plyometric exercises being the focal point of the rehabilitation program were analyzed. Most results came in as quantitative readings of muscle strength, body sway and joint range of motion. The research of 2 studies suggested that plyometric exercises are effective in returning strength and proprioception in rehabilitation exercises but more research is needed. One study showed that plyometric training had no effect when implemented in rehabilitation programs. Plyometric exercises can be effective when attempting to increase muscular strength, but can pose risks when dealing with poor proprioception.  (Mentor: Molly M. McDonald)

**Properties after Refinement of Biodiesel: Josh Schulte.** With the leadership and direction of Dr. Christina Edwards, the goal of this research project is to synthesize biodiesel and discover a refinement process that is efficient and affordable to produce federal grade fuel. Using multiple substrates the biodiesel was synthesized and the properties of the different biodiesels were tested. The properties tested were density, viscosity, flash point, and heat of combustion. Using the tested properties, refinement processes were to be determined to create federal grade biodiesel. A refinement step would be performed, then the same properties were tested again to determine if the refinement process had created a more efficient biodiesel. If the refinement process was determined to create a more efficient
biodiesel, then the process was to undergo cost effective testing. The project aims to discover a refinement step that is cheaper than current refinement steps used in the synthesis of federal grade biodiesel. (Mentor: Christina M. Edwards)

**High Frequency Trading’s Effect on Market Efficiency:** Justin VanWambeke. This paper will examine the introduction of high frequency trading (HFT) and its effect on the efficient market hypothesis of the United States markets. In this study, I will look at studies that analyze the tactics used by high frequency trading firms and how these strategies affect liquidity within the market, price discovery, and arbitrage opportunities. High frequency trading was originally thought to increase overall market efficiency and improve bid ask spreads. There have been studies supporting the benefits of HFT, the “flash crash” of May 6th, 2010 provided insight into potential negative side effects of HFT. My hypothesis is that high frequency trading supports the efficient market hypothesis making the market more transparent and liquid. This topic is relevant to economic research because the introduction of high frequency trading has replaced the role of physical arbitragers with high speed algorithmic trading platforms as well as improved price discovery and liquidity for individual and institutional investors. Data will be gathered from a variety of published sources as well as trade organizations such as NASDAQ historical dataset and CBOE index. These sources provide the history of trade transactions including price, volume, and time of trades. (Mentor: Jennifer J. Smith)

**Cross-Cultural Familial Perceptions of Autism and Access to Treatment:** Kristen A. Ricondo, Kimberly A. Breaux, Kara M. Zwanziger. Qualitative research was conducted with families in Malaysia, Wisconsin, and Iowa to determine implications of diagnosis and treatment options pursued for children on the Autism Spectrum. In-depth interviews with parent(s) of children who have autism were carried out that inquired about the diagnosis process, cultural experiences, familial implications, treatments utilized, and any other information families wanted to share. Results showed differences in diagnosis and treatment between Malaysia and the United States. The United States has an outlined diagnosis process, more treatment options, and partial funding available for most families. In Malaysia there is more support provided to families by their extended family. Results also show that families struggle with learning more about autism and navigating the system which has motivated us to create and provide workshops that parents can attend for assistance. (Mentor: Steffanie J. Schilder)

**The Effectiveness of Aquatic Therapy on Low Back Pain:** Kathleen Ann Cabrera. Low back pain can be caused by various injury pathologies, such as herniated or degenerative discs, nerve impingement, and spinal deformities. Treatment for low back pain may vary depending on the injury, but a few common methods include manual manipulation, physical therapy, aquatic therapy, and surgery. Using aquatic therapy for the treatment of lower back pain is becoming increasingly popular because it creates weightless resistance that avoids compressive forces and high impact movements. This critically appraised topic reviewed effectiveness of aquatic therapy in treating chronic lower back pain. The studies selected focused on pain level, disability, and overall quality of life through various subjective pain scales, and objective measurements such as the sit-and-reach test, curl-up test, and 1 mile run/walk. All articles met at least an 8/11 on the PEDRO Scale, indicating its validity. The research recommends that aquatic therapy improves quality of life by reducing pain and
functional disability. However, the effect of aquatic therapy on the psychological aspect of the injury or pain and neurophysiological education is unknown. (Mentor: Molly M. McDonald)

**Italy: Communication for Communion:** Kathryn Bailey. Maria A. Munoz-Mosquera, Zachary D. Jeffries. Looking particularly at the Renaissance and Modern/Post-Modern periods, we studied the way the church has communicated in three specific ways - through art, architecture, and writings of church representatives. From papal encyclicals, to Catherine of Siena’s letters, the messages communicated by the Catholic Church have varied in intensity, poignancy, and purpose. Additionally, the ways in which messages have been delivered have impacted both their reception and their fruitfulness. In that same vein, we learned that the structural architecture in which buildings, monuments, and churches are constructed will greatly influence the sense of communion that is transmitted. Our travels allowed us to engage with the wider church and individuals that have been shaped by the church’s communications. (Mentor: Amanda C. Osheim)

**Issues of Autism Awareness: Kayla J. Thompson, Olivia R. Clarey, Rachel A. Valente, Davis D. Dahlberg.** This poster presentation for our sophomore honors group details the issues in awareness of autism in the Dubuque area. Our goal in this three-year project is to raise awareness and educate the area on this mental health diagnosis since our research has found minimal resources to help those affected. We are currently working to create a brochure to provide information and resources to local families affected by autism and hope to be able to work with them in the future.  (Mentor: Steffanie J. Schilder)

**The Effects of Exercise on Patients with Non-alcoholic Steatohepatitis:** Kelly Jannings. This critically appraised topic investigates utilizing exercise to treat patients with non-alcoholic steatohepatitis (NASH). NASH is a fat buildup on the liver that leads to inflammation followed by subsequent damage to liver cells; and eventually a decrease in detoxification, filtration of blood, and production of bile. It mimics signs and symptoms of regular cirrhosis, but NASH patients are not heavy alcohol drinkers or drug abusers. The disease is associated with obesity, thus one intervention is adding an exercise program to the patient’s daily routine to promote overall health and maintenance of the disease. Three A or B level, 8/11 on the PEDRO scale, prospective articles were analyzed and overall the research supports that patients with NASH who add exercise to their daily routine see improvements in BMI, glucose levels, liver enzymes, insulin resistance, and overall health. Although the cause for NASH diagnosis is still being researched, adding an exercise program is an easy and efficient method to prevent and maintain the disease. (Mentor: Molly M. McDonald)

**Effects of Environmental Enrichment on Corticosterone Levels in Mice:** Kristen Hirsch, Dayton T. Olson. Lab mice are commonly used as models for scientific experimentation, but their housing conditions are often less than accommodating. Studies have shown that improving the environment in which these mice are housed can lead to positive effects on their well-being, such as alleviation of pain, improved learning ability and decreased anxious behaviors. This study examined the effects of environmental enrichment (i.e., the addition of toys and exercise wheels) on stress levels of laboratory mice over the course of 9 days. Changes in stress were monitored by testing corticosterone levels in fecal matter both before and after the addition of external stimuli into the home cage, as well as via behavioral observation. We hypothesized that environmental enrichment would decrease baseline corticosterone levels in those provided with an enriched environment. Compared to a control group, however, no significant differences in corticosterone levels in the
experimental group were observed, and neither group exhibited corticosterone concentrations outside of the normal, non-stressed range (roughly 15,000-100,000pg/mL, based on the mouse’s estrus cycle), indicating that basic housing conditions are not demonstrably stressful to lab mice. Further experimentation could monitor stress levels in mice using a different assay or using the current assay after a longer treatment period.  (Mentor: David A. Shealer)

Cost and Benefits of Hosting the Olympics: Kyle Hilburger. The Olympics, which is one of few mega-events hosted in the world, has historically been hurtful to countries that host these events. The costs of building infrastructure and hosting the events have been much higher than the cash flow brought into a country. In this research project, I will be examining the impact hosting an Olympics has on a country when the Olympics has previously been hosted in years past. Certain costs associated with hosting the Olympics a second time are then negated due to the cost of the first, and I will be examining the effects of how much more profitable hosting the games is a second time compared to what has historically been a huge loss.  (Mentor: Jennifer J. Smith)

L.L.P Internship: Kyzer Moore, Reynolds and Kenline. The purpose of this internship was to gather a better understanding of the legal side of the criminal justice system. There are three pieces to the criminal justice system and prior to this internship, I had experience with the law enforcement and corrections side of the criminal justice system. Before graduation, I wanted to experience the third piece of the criminal justice system, the courts, which I was able to do through my internship at Reynolds & Kenline. While at Reynolds & Kenline, as an intern I was able to work on gathering information for the attorney to use in cases, help create presentations to be used for mediations and court proceedings and gain an overall better understanding of the court system in the United States. The internship was three hundred hours, spread out over seven months beginning in February of 2016 and ending in August of 2016. The final piece of the internship was attending a court proceeding for a case I had helped the attorney with and observe it. The internship gave me an in-depth view of the court side of the criminal justice system and helped my criminal justice education come full circle.  (Mentor: Leonard R. Decker)

The Influence of Gender on the Working World: Lauren Ehardt. Occupational gender segregation is a well-documented issue. The ways in which they become segregated is also an important question in the research. This project considers one element of how occupations become separated by gender: male perceptions of careers. In order to better understand how associations between a particular gender and certain careers can be formed, open-ended, qualitative interviews were conducted on ten male, college students. The knowledge of how men view specific careers is important because it may influence their educational decisions and what career they eventually end up in. Ultimately, these decisions can contribute to maintaining the separation and stereotypes of genders. Through the interviews, it is found that the career paths that men have chosen correlates with their idea of ‘masculine’ jobs, which they develop from a number of factors such as their observations of their parents and other role models’ careers, influences of society as they have grown up, and their exposure to social media.  (Mentor: Lisa L. Garoutte)
**Designing a New Bioengineering Tool: Will Altering Asparagine 171 Change the Specificity of rTEV?: Levi Hongsermeier.** rTEV is a enzymatic protein that is used as a laboratory tool to cut fusion proteins at a highly specific recognition sequence (E-X-X-Y-Q-[G/S]). rTEV has been widely used yet has been seldom studied. It has been suggested by Phan et al. that rTEV could be altered so as to influence its ability to recognize the traditional rTEV recognition sequence (JBC. 2002, 277, 50564–50572.). Based upon this proposed alteration, site directed mutagenesis was carried out to replace the Asparagine at position 171 to an Aspartate. This alteration would affect the shape of the substrate binding pocket. The mutant rTEV is expected to retain the general characteristics of wildtype rTEV except for an affinity to a different recognition sequence (Q-X-X-Y-X-Q-[G/S]). This mutant could act as a useful laboratory tool and confirm the current understanding of rTEV’s structure-function relationship. (Mentor: David C. Speckhard)

**Hispanic Ministries in the Midwest: Lori Obendorf.** This project is an analysis of the structure, organization, and effectiveness of Hispanic ministries in the Midwest. Hispanics make up a large portion of the Catholic population in the country, and ministries exist in order to meet their unique needs regarding sacraments, faith formation, immigration, health care, and education. By examining general information about the functioning of Hispanic ministries, as well as their implementation in specific dioceses, I clarify what makes a ministry effective in serving Hispanic Catholics. My research focuses on the ministries of two specific dioceses; the Archdiocese of Dubuque, which serves northwestern Iowa, and the Diocese of Joliet, which serves the southern suburbs of Chicago. Information will be collected through interviews with ministry directors and clergy, reports including Boston College’s National Study of Catholic Parishes with Hispanic Ministry, and analysis of the current products, practices, and perspectives of the identified Hispanic ministries. By comparing ministries in areas of differing city and population sizes, I identify how the structure and organization of Hispanic ministries differs depending on community need, environment, and demographics. I also use Catholic social teaching to clarify what components of Hispanic ministry should remain consistent across varying types of dioceses. This project not only identifies aspects of effective Hispanic ministries, but also offers suggestions for their development and improvement as the Hispanic Catholic population continues to evolve. (Mentor: Kate A. McCarthy-Gilmore)

**Exploring the Correlation between Fetal Testosterone Level and Financial Trading Ability:** Lori Obendorf, Jenna M. Walleser, Justin D. VanWambeke. This research project examines the correlation between fetal testosterone level and financial trading ability. In a study of financial traders in London, higher fetal testosterone levels were found to be significantly positively correlated with financial trading success. These results suggest that fetal exposure to testosterone has effects on the brain that result in skills needed by financial traders. Our study sought to examine the relationship between fetal testosterone and skills associated with successful financial traders in college students. Loras college students were given The Frederick’s Cognitive Reflection Test (CRT) to measure their ability to process information quickly, confidently and correctly in a stressful environment without relying on mere intuition. Since the ratio of index finger to ring finger (2D:4D) is a biomarker for exposure to fetal testosterone, each student’s finger ratio was also determined. We predicted that students who scored well on the CRT would have higher levels of testosterone as indicated by a low 2D:4D ratio. While males scored significantly higher (p = 0.0065) than females on the CRT, students’ finger ratios did not have a significant effect (p = 0.3606) on CRT score. (Mentor: Fred B. Schnee)
Effects of Predator Odor (2-phenylethylamine) on Risk-Taking Behavior in Mice: Mackenzie Anderson, Mikaela Lengwin & Skye Miller. The purpose of this study was to determine whether an exposure to predator odor would alter or influence the willingness of mice to seek a food reward. Twenty outbred CD-1 mice (ten female; ten male), were randomly assigned to a treatment group or control. The mice were tested in an X-shaped maze that consisted of a corridor at the end of each arm of the X. Each mouse explored the maze for three minutes before the reward and predator stimuli were placed in two of the four corridors. The mice were then allowed to explore for seven minutes while investigators recorded the time each mouse spent in the various corridors, the time spent in the center of the maze, along with observations of behavior. Mice were deprived of food prior to their test trial to ensure that they would be motivated by hunger. A two-factor MANOVA statistical analysis was conducted in order to explore the relationship between these variables. The treatment and sex variable significantly affected the time spent in the corridors with food and in the center of the maze. Our results indicate that predator odor has an influence on risk taking behavior in mice. (Mentor: Jake C. Kurczek)

The Role of Actin-Associated Proteins in Dictyostelium Discoidium: Margaret Durdan. Cancer cells are dangerous and deadly, especially when they move from place to place in the body. While cancer cells are more difficult to study in the lab, the social amoeba Dictyostelium has been shown to move in similar ways and contains homologous genes to humans. Therefore, we are able to learn more about the movement of cancer cells by studying the movement of Dictyostelium cells in the lab. PSTPIP1 is a protein found in both Dictyostelium and cancer cells, and previous research gives evidence to believe that there may be a relationship between PSTPIP1 and the movement of cells. In my experiment we will remove PSTPIP1 from Dictyostelium, and investigate the effect on the cells’ movement. Alternatively, other proteins involved in actin and cell movement will be targeted. Under-agarose assays are used to test the movement of the cells, and their movement is recorded via time-lapse video microscopy. Data for ideal cell movement conditions has been determined. Through these experiments I expect to see if PSTPIP1 or other actin-associated proteins are required for normal cell movement to folic acid. Then further research will investigate the mechanisms of these effects, which may give insights as to the migration of cancer cells. (Mentor: Kate M. Cooper)

Undocumented Immigration: Myths vs. Realities: Margaret Sentovich. This paper is an examination of the issue of undocumented migration from Latin America, primarily Mexico, to the United States, which, though it has existed since the creation of a national border, has become a highly politicized and controversial issue since its emergence into mainstream public consciousness in the 1990s. Given the vast disparities between public perceptions and realities of undocumented migration, this paper examines the social and political motives behind the scapegoating of undocumented migrants and the repercussions of such a mindset on both the documented and undocumented migrant communities. The research for this paper will be conducted through academic articles from online databases, with evidence for the hostility presently facing the Latinx community as a result of anti-immigration sentiment coming from more informal sources such as newspaper and social media. By studying the social context surrounding the discourse on undocumented immigration, I hope to expose the xenophobia and nationalism underlying it. Additionally, I seek to demonstrate how the policies of the current political administration, particularly the executive office, exacerbate the myths regarding undocumented migration to the
detriment of the Latinx community and American society as a whole under the pretense of protecting the American people.  (Mentor: Kate A. McCarthy-Gilmore)

**How Undocumented Immigration Impacts the U.S. Economy:** Margaret Sentovich. This paper is a non-quantitative analysis of the economic impact of undocumented migration into the United States since the issue’s entrance into the public light upon the passage of the North American Free Trade Agreement (NAFTA). The theory of labor demand and supply, which underlie the phenomenon of migration, are the economic lens through which this type of research is conducted, as they provide insights regarding the motivations of both the migrants entering the U.S., and the U.S. citizens who receive them. Misconceptions surrounding the economic impact of undocumented migration abound in the United States, largely due to the media’s sensationalism and the public’s lack of fundamental economic understanding. Through research stemming from academic articles, along with evidence from popular media sources, this paper looks beyond the shallow and dismissive public perceptions of undocumented migration and provides a detailed analysis of the concrete ways in which it impacts American laborers, enterprises, consumers, and the economy as a whole. (Mentor: Jennifer J. Smith)

**Blind Eyes and Deaf Ears:** Maria Camila Saenz. In this research paper, I discuss whether America should keep using surveillance cameras and wiretaps for a better security in the country with respect to terrorism. There is a very explicit information about surveillance cameras and wiretaps, their impact, and consequences. Moreover, I believe in George Orwell’s prediction about a controlled society where privacy doesn’t exist at all. I cite several authors and also real opinions of citizens that have lived true experiences with wiretaps and surveillance cameras, I really appreciate when people can tell their story in order to transmit a message. This paper tries to make people realize about the security in the country, if it is truly worth it or if it just suppresses privacy. Finally, it tries to question the audience about what seems obvious for their eyes, but that, in reality, it has deep and interesting information that will help them to have a critical thought about the place where day are living. (Mentor: Scott K. Scheuerell)

**Growing old: Parents’ and adult Children’s Plans Regarding Future Care:** Mark Tilkes, Mary Phillips, Morgan Lacher, Patrick Short, Mark G. Tilkes, Morgan P. Lacher, Mary K. Phillips, Patrick J. Short. As adults grow old, both aging parents and adult children must discuss future caregiving plans. Do caregiving expectations and values regarding aging differ between them? Does self-construal, religiosity, and materialism play a role? Through surveys and in-depth interviews we compare and contrast expectations, opinions, and influences across and within families. These families are combined of both parents and children. The parents will be at least 70 years of age and at least one of the children will be living in Dubuque. These interviews will be transcribed in search for themes across and within these families. We will also be searching for themes that correspond with the values of aging and how being a part of the sandwich generation influences these values. (Mentor: Lisa R. Grinde)

**Hydrodynamics of a Unmanned Underwater Vehicle:** Marshall Jackson. To improve the efficiency and the overall performance of the UUV drone, its hydrodynamics needed to be optimized. Which meant that significant testing had to be done to ensure that the shape of the UUV would be best suited for the movement that it would be doing under the water. This meant that the UUV needed to be streamlined
so that the drag could be minimized. The research found that if the projected area is minimized along with an elongated back that one can minimize the effective drag on a specific object. Our UUV had met most of this criteria and performed well in the tests. Although more can be done to improve the shape of the UUV to make it more hydrodynamic.  

(Mentor: Kristen A. Thompson)

**Building Unity out of Diversity: Multicultural Family Center: Jenna Scheer.** This poster will reflect a semester long internship at the Multicultural Family Center.  

(Mentor: Mary M. Johnson)

**Access to Rehabilitative Services for Members of the Latinx Community with Disabilities: Mary Phillips.** While a recent influx of Spanish speaking immigrants, primarily from Central and South America, into the United States leaves health care providers with a moral and ethical responsibility to adapt to a change in linguistic and cultural interactions, ethnic disparities in health care access and treatment still exist. This paper aims to examine the private and public barriers members of the Latinx community with disabilities face in accessing quality, efficient, and trustworthy rehabilitative services in the United States: Critical services that will impact the future quality of life for an individual with a disability. In order to complete this project, I will use psychological research studies, news reports, and governmental publications. Importantly, I will also include qualitative interviews, which are important mediums by which a commonly silenced Latinx community may share their first-hand perceptions and experiences. Through these investigations, I hope to emphasize that understanding a disability, accessing rehabilitative care, and advocating for oneself is extremely difficult in the face of the additional private barriers, such as familial responsibility, and public barriers, including a lack of translators, that are the reality for many people of Latinx community. Additionally, I hope to advocate that movement toward a more beneficial, culturally competent social service system is not simply an obligation of medical professionals but also an upholding of human dignity and human rights.  

(Mentor: Kate A. McCarthy-Gilmore)

**Antibacterial Effects of Different Cultivars of Garlic on an Array of Bacteria: Matthew Anderson.** There is growing interest in the use of phytochemicals as potential antimicrobial agents. Allium sativum, commonly known as garlic, may have antibacterial effects against a wide array of bacteria. The objectives of this study were to determine: (i) if different cultivars of garlic have varying inhibitory effects on six nonpathogenic strains of bacteria, and (ii) if the cultivars are more effective at inhibiting bacterial growth than known antibiotics. The Kirby Bauer disk diffusion method was used to measure the zone of inhibition of bacteria exposed to garlic. The garlic cultivars used were Spanish Roja, Romanian Red, Korean Red, Georgian Fire, and Inchelium Red. The bacteria used were three gram negative (S. marcescens E. coli, N. capsulatum) and three gram positive (S. epidermitis, S. ureae, and S. aureus). Spanish Roja, Romanian Red, Korean Red, and Georgian Fire had significantly higher inhibitory effects on the bacteria than Inchelium Red. Additionally, all garlic cultivars tested were significantly more effective at inhibiting the growth of bacteria than the four antibiotics tested. The different cultivars of garlic may inhibit bacterial growth differently due to varying concentrations of secondary compounds present. The results from this study provide further insight into the antimicrobial effects of garlic.  

(Mentor: Aditi Sinha)
Haiti J-Term 2017: Mckenna Gillespie. Haley L. Brock, Reilly C. Kuhn, Lauren R. Bollweg, Kayla S. Marti, Natalie G. Oltmanns, Rachel E. Prendergast, Elizabeth A. Kluge, Taylor A. Ilg, Mariah A. McCarty, Mckenna Gillespie, Joshua D. Schulte, Natalie M. Shannon, Leta M. Jaquis, Mildred C. Chihak, Emily N. Witt, Lea M. Lovell, Laren R. Lenth, Andrew R. Grossklaus, Catherine E. Paulsen, Brittany A. Lijewski. The main focus of this presentation is on the service learning experience we had over this past J-Term in Haiti. Our service learning experience tied into Loras dispositions such as active learning and reflective thinking. The three legs of the service learning stool--learning, service, and reflection--contributed to our experiences in Haiti as well. Through our service learning experience in Haiti, we were able to experience Haitian culture hands-on, something that could not be done in the classroom. We worked with a wonderful organization called Partners in Development. Staying with them during our time in Haiti allowed us to fully immerse ourselves in the Haitian culture and lifestyle.  (Mentor: Eric P. Eller)

Permeability of PLA and Waterproofing PLA: Michael Krol. Our senior engineering project is to build a submersible drone. One of the largest issues with the project has been to make the housing waterproof. Using standard settings, material printed on the Makerbot printers is not waterproof because the 3D printer prints each object in layers, leaving a space between each layer that allows water through. On the highest quality setting we would be able to make the casing waterproof but it is unrealistic to use this setting because the print time is approximately 130 hours. We have been tasked with using a lower quality print setting which will lower the print time down to a manageable level. When conducting initial tests with the lower quality print setting, we experienced issues with waterproofing the drone. After the completion of research, we have determined that an epoxy resin can solve our waterproofing issues.  (Mentor: Kristen A. Thompson)

An Examination of Sport and Event Venues Trends: Michael Muto. Benjamin A. Milks, Maura C. Walsh. The unprecedented growth of sport stadiums and arenas in the past 20 years has challenged facility managers and designers to identify innovative ways to serve fans, athletes, coaches, and the media. This project addressed three significant trends in the sport facility industry: accessibility, risk management, and technology. The impacts of the Americans with Disabilities Act on stadium accommodations has made venues more accessible and welcoming for everyone. Due to an increasingly litigious society in combination with terrorism concerns, security and risk management are an important aspect of facility design, maintenance, and overall event management. Technology demands from patrons and media, have lead venues to ‘one up’ each other and ultimately improve their services. Specific examples of venues from the January Term travel course to Nebraska will be featured including the University of Nebraska football, basketball, and multipurpose training facilities, as well as, the home of the college world series Ameritrade and Century Link Center.  (Mentor: Anne C. Marx)

Impunity and Volence Against Women in Mexico: Mildred Chihak. In Mexico, drug violence has led to police impunity, giving the opportunity for injustice of crimes against women. This includes rape, strangulation, torture, feminicide which is the murder of females. With this inequality, women are seen as disposable and predators are allowed to remain at large. In 2007, a law "Ley General de Acceso de las mujeres a una vida libre de violencia", was established to protect women from violence. However few crimes, when reported, are investigated and prosecuted. Pressing charges can also lead to being extorted by the police. By examining impunity and violence against
women, I clarify why femicide and domestic abuse has risen in Mexico. I will also explore the support available to those affected. I will use archives, newspapers, personal accounts, and published studies in order to explore impunity as a domestic issue that has forced Mexicans to rely on their communities rather than their government to protect them from violence. (Mentor: Kate A. McCarthy-Gilmore)

**Distribution of Oriental Bittersweet, an invasive plant, using Geographic Information Systems in Mines of Spain Park, Iowa:** Mitchell Rubino.

*Celastrus obiculatus* or Oriental Bittersweet is a deciduous vine native to eastern Asia. In the United States, it is an invasive plant that invades forests. It can engulf the canopy and girdles trees as it wraps itself around the trunks of trees. The objectives of this research were to (i) examine the distribution of *C. obiculatus* in the Mines of Spain State Park, Iowa using Geographic Information System (GIS), and (ii) determine if the ecological variables that affects its distribution. Using a GPS, the presence/absence of *C. obiculatus* was recorded along linear transects. Geospatial layers of features such as streams and rivers, trails and roads, and soil were obtained from the Iowa DNR geodatabase. The distance between the above mentioned features and presence/absence points were determined using GIS. A total of 14.9 miles of trails were surveyed and 3100 occurrences of *C. orbiculatus* were recorded. Preliminary analysis indicate that *C. obiculatus* shows a clumped spatial distribution and prefers lower elevation sites. The findings of this study will provide insights into the distributions of the species and help with management and conservation of this newly established species in Iowa. (Mentor: Aditi Sinha)

**The Sounds of Your Mind: Coping with Depression and Anxiety through Music:** Molly Walkner, Kristen R. Hirsch, Riley J. O'Brien, Blake A. Derby, Lauren R. Bollweg. Many people who struggle with depression and anxiety disorders have a need to express their thoughts and feelings but do not feel comfortable doing so in traditional therapy. Music therapy provides a way to fill this need via playing, composing, dancing, and listening to music (Davis, 2008). Music therapy can meet the needs of many patients, especially those with depression or anxiety disorders, as it “can act as a supportive, activity-oriented therapy, as a re-educative, insight oriented therapy, or as a reconstructive, analytic tool” (Davis, 2008). The focus of this project is to study depression and anxiety in early-to-middle-adulthood and how music can be used as a coping mechanism for those suffering from mental illnesses. We aim to educate those in the Dubuque community about depression and anxiety disorders while providing a comfortable environment for those struggling with mental illness to express their thoughts and feelings via musical exploration. We will be working with a nonprofit organization in the Dubuque community to achieve this goal of education and expression for individuals seeking aid. (Mentor: Naomi K. Clark)

**Pachamama and Pipelines: The Effect of Industrial Development on The Indigenous People of Ecuador:** Morgan Francis Drew. Incan culture is inseparably woven into the land; this union embodied by one of their major deities, Pachamama, the earth goddess. Based in the Andean regions of South America, the native Incan people have been subject to the changing environment, which has been stressing their relationship with the land. The Achuar sect of the Incan people in Ecuador have had their lives, culture, and homes disrupted, displaced, and destroyed as a direct result of industrial development practices such as logging, mining, and oil drilling. This study aims to determine how the consequences of industrial development in Ecuador have affected the indigenous populations, what has been done
to resist development, and how the cultural beliefs of the Incan people have been used to create change. To accomplish this, the utilization and analysis of three types of sources is key: business records, activist literature, and journalism articles. The Pachamama Alliance is one such activist group dedicated to preserving indigenous rights and heavily focuses on advocating for these people against industrial development. As one of the major groups providing the global community with information about these indigenous cultures, they are afforded the authority and responsibility for determining the value and ownership of the Incan beliefs. (Mentor: Kate A. McCarthy-Gilmore)

Access to Preventative Healthcare Services in Latinx Populations in US: Morgan Lacher. This thesis discusses the pressing issue of the lack of availability of preventative health care services for undocumented Latinx immigrants and their families in present-day United States. I demonstrate the inability for most immigrants, primarily from Mexico and Central America, to obtain preventative healthcare due to political, social, economic, and cultural barriers. Many mixed immigration status families are unable to pursue preventative medical assistance due to the fear of separation. These claims are supported by scholarly journal articles as well as first-hand testimonials from immigrants and healthcare professionals to provide relevant experiences. Through these analyses, the Affordable Care Act and its potential repeal will be investigated as well as the current healthcare related difficulties for individuals under the Deferred Action for Childhood Arrivals. This thesis understands the struggles associated with this violation of universal human rights to adequate health care; therefore, I argue the need for the healthcare system to provide adequate preventative health care services to all individuals who reside in the United States and not solely emergency services. The thesis desires to enlighten individuals on the abundance of health barriers that persist in the passage to and during the residency in the United States, especially for Latinx immigrants. (Mentor: Kate A. McCarthy-Gilmore)

Replacement of the Heitkamp Planetarium Projector: Natalie Droeske, Jacob T. Till, Audrey M. Miller, Austin J. Kuchenbecker, Celia E. da Silva. The current planetarium projector is in a state of dysfunction, and must be replaced to ensure the continuing functionality of the Heitkamp Planetarium. Our group is working closely with Dr. Kristen Thompson and Dr. Kenneth McLaughlin in pursuing appropriate replacement models and funding options. We have begun to expand our research to include community partners (both on and off campus), and plan on submitting at least one grant application for possible replacement projector funding before the close of the spring semester. This project is in pursuit of the betterment of both Loras and its service to the Dubuque community and is of vital importance being the only functional Planetarium in Dubuque and the surrounding areas. (Mentor: Kristen A. Thompson)

The Cost of National Security: Nathan Huinker. My argumentative essay covers the cost of national security. The cost is giving up some civil liberties temporarily in order to obtain it. In current events there is lots of discussion on the extreme vetting of immigrants coming into the country in order to better know who is entering our country so that we may keep the people safe. While my essay does not cover the vetting of immigrants it does however cover airport security measures and the NSA’s ability to track everything we do. So should we give up or suspend some of our civil liberties to achieve national security? I am here to say that we as Americans need to compromise on the suspension of some of our civil liberties to achieve the security that we desire as a nation. What is presently in place to protect us is
definitely within compromise and should not cause alarm to those of us affected which is inherently all of us. This provides an alternative area of interest for national security while avoiding the highly disputed vetting of immigrants.  (Mentor: Scott K. Scheuerell)

**US-Cuba Immigration Relations from 1959 on:** Niamh Mc Partlin. The purpose of this project is to examine US-Cuba relations with an emphasis on the topic of immigration, given the clear contrast between former President Barack Obama’s welcoming policies and current President Donald Trump’s outward isolationist policies. By focusing on the relative histories between the countries from 1959 on, I aspire to see how the theme of isolationism will affect ongoing thawing relations between the US and Cuba and how Trump’s seemingly xenophobic tendencies will be reflected as he pushes to further his immigration agenda. Most of my research will be on how such policies and a newly established presence of isolationism within relations because of President Trump’s victory has and will play a role in affecting Cuban communities both within and outside of US borders through studying past immigration policies, government operations, as well as other scholarly archives and articles reflecting the topic. From this research, I hope to not only analyze Trump’s proposed immigration agenda in comparison to that of Obama’s and his final actions in office, but I plan to place high emphasis on the effects that Trump’s proposed agenda will have on immigrant communities over the course of his term.  (Mentor: Kate A. McCarthy-Gilmore)

**History of Chinese Nationalism:** Niamh T. Mc Partlin, Jordan K. Hendrickson, Michael S. Olszewski, Alexander M. Johnson. This is a joint presentation between 4 of Dr. Darr’s J-Term students who travelled to China to study the topic of nationalism and how it was altered and shaped within the Chinese culture to reflect an identity based off the themes of national humiliation and rejuvenation. We sought to investigate the progression of Chinese national identity throughout the course of the country’s history, ranging from imperial times to the post-Mao era of the modern day. Through our experiences and travels to various temples and monuments within the cities of Beijing and Xi’an as well as through references to Zheng Wang’s Never Forget National Humiliation and other scholarly sources, we sought to compare how the topic has been integrated and preserved within society and how the Chinese people themselves perceive their national identity in their everyday lives. This visual is meant to relay such findings at both the community and national level and is meant to show how the theme of national humiliation came to define modern Chinese national identity.  (Mentor: Benjamin J. Darr)

**Bioengineering a Fusion Protein: Syndecan1 BFP:** Nick Nemmers. Syndecan1 and TIAM1 are both proteins found within the body and their interaction has been associated with metastasis of some cancer cells. Little is known about how this interaction signals cell migration, but inhibiting it could potentially keep cancerous cells from moving. DNA manipulation procedures were used to create the Syndecan1 BFP construct. The ultimate goal of the project is to study the engineered protein's binding interaction with another student's TIAM1 YFP protein. The first goal of creating the DNA construct has been completed and results show the ability to introduce DNA plasmid into competent cells as well.  (Mentor: David C. Speckhard)
Motivation to Learn: Olivia Clarey, Brant W. Gille, Samantha Wagner, Caitlin E. Reynolds. Motivation to Learn is a Poster Presentation developed out of EDU 265, Multicultural Education. The advanced general-education course followed the 3 week January Term schedule and included a week-long trip to Sarasota, Florida. The 10 students in the class spent time observing teachers, learning about student motivation, and school choice. The overall goal of the course is to gain a better comprehension of Multicultural Education, tolerance, and inclusion in the classroom. An important aspect of the course was to learn about and identify the multiple options available for school choice. This individual presentation reflects on the experience of 4 students and the influence the field-experience had on their future as educators. They observed teacher motivation and relationship-building between students and teachers, which provided insight to the Loras students. The course materials also provided students with textual support and ideas about incorporating every student in their classroom for effective instruction and meaningful learning. Motivation to Learn highlights the important lessons learned in January 2017. (Mentor: Hilarie B. Welsh)

Halting Juvenile Delinquency Through Alternatives To Incarceration: Cook County Juvenile Probation Internship: Patrick Short. During the months of May 2016 to July 2016, I was given the opportunity to conduct my criminal justice field instruction with Cook County Juvenile Court Services as an intern with the probation division and under the supervision of DCPO Melissa Spooner. My name is Patrick Short and I am currently a senior at Loras College double majoring in Criminal Justice and Psychology. I pursued a position with this agency because I have always been fascinated by the court process and the cycle that juvenile offenders go through when confronted by the Juvenile Justice System. My internship mainly consisted of participating in field observations, participating in seminars, helping to facilitate the Juvenile Advisory Council program and researching new programs for the Juvenile Court to utilize with their clients in the future. A core component of the juvenile court was the Juvenile Detention Alternatives Initiative (JDAI) which was implemented to prevent youths who committed low-level crimes from being incarcerated by providing alternative programming. In addition to probation officers, I gained valuable insight into the role of many other professionals who work directly to facilitate crime prevention and create programs to assist troubled, at-risk youth with staying out of trouble. (Mentor: Leonard R. Decker)

Rock and Roll Communities: British Invasion-London: Daniel J. Breakey, Brad J. Jerantowski, Jessica N. Miller, Cole R. Brandt. This presentation examines the historical context of the British Invasion as it occurred in London from 1963-67. (Mentor: Paul R. Kohl)

Rock and Roll Communities: Psychedelic San Francisco: Hailee M. Hilmer, Robert J. Hovey, Megan E. Kennelly, Gregory M. Cybulski. This presentation examines the historical context of the Psychedelic Era in San Francisco, 1965-69. (Mentor: Paul R. Kohl)

Rock and Roll Communities: Early Rap Era Bronx: Zachary P. Frett, Benjamin D. Pashon, Nicholas F. Spiess, Jacob T. Formella. This presentation examines the historical context of the Early Rap Era in the Bronx, 1978-82. (Mentor: Paul R. Kohl)
Rock and Roll Communities: Rockabilly Memphis: Grace A. Haggerty, Molly M. Nemmers, Mckenna Gillespie. This presentation examines the historical context of the Rockabilly Era in Memphis, 1954-57. (Mentor: Paul R. Kohl)

Rock and Roll Communities: Motown Era Detroit: Christina R. Helmold, Jordan J. Schultz, Genevieve J. Brockway. This presentation examines the historical context of Motown Era Detroit, 1959-69. (Mentor: Paul R. Kohl)

Rock and Roll Communities: Punk Era New York: John V. Craine, Charles R. Roth, Kyle T. Brzeszkiewicz. This presentation examines the historical context of Punk Era New York City, 1975-78. (Mentor: Paul R. Kohl)

Rock and Roll Communities: Disco Era New York: Michael C. Ruehlmann, Bradley A. Schwind, William K. Quinn. This presentation examines the historical context of Disco Era New York City, 1974-79. (Mentor: Paul R. Kohl)

Treatment of Pectus Carinatum in Athletes: Paul Kraus. This critically appraised topic aims to investigate whether bracing or minimally invasive surgery should be used in the treatment of athletes with pectus carinatum. Pectus carinatum is a protrusion of the sternum often caused by the costal cartilage having an abnormal or unequal growth. This condition can impact functionality of the heart in athletes, including adding additional pressure on the heart, which will place stress and strain on the cardiovascular system. Three quality research articles were analyzed to determine the best treatment for athletes suffering from pectus carinatum. Although evidence supports both minimally invasive surgery and bracing, often times one may work better than the other, depending on the age and physical maturation of the athlete. Overall bracing is effective in a younger and physically immature population, while surgical intervention has shown effectiveness in physically mature patients. While research continues regarding the best treatment for pectus carinatum, both interventions are currently effective and applicable to specific athletic populations. (Mentor: Paul R. Kohl)

Argentina and the Dirty War: Memorializing the Disappeared: Paulina Le. This research examines how Argentines have memorialized the Dirty War that occurred under the military dictatorship from the mid-1970s to early-1980s. The military junta lead by General Jorge Videla, also called the Proceso de Reorganización Nacional, marked the era of state terrorism. After the fall of the military junta, Argentina’s atmosphere was laden with impunity and silence, which has affected its ability to memorialize los desaparecidos (the disappeared), who were kidnapped, tortured and murdered by the regime. This research aims to understand how even after 30 years since the military junta ended, the national memory to recount the true events is dependent on citizens rather than the government, which attempts to alter the memory into a sterilized, rationalized and dehumanized view of state terrorism and the Dirty War, and how this relationship between citizens and the government affects public space and national memory. The lack of adequate memorialization for the 30,000 disappeared risks the possibility of history repeating itself in hopes to protect national identity. From personal accounts of survivors and relatives of the disappeared and including those of a former Naval Captain and his wife, it paints an image as to how impunity and the Catholic Church affect memory and denial of the terrors that had occurred. (Mentor: Kate A. McCarthy-Gilmore)
A Night to Remember- Formal for Disabled Community Members: Rachel Prendergast, Patrick B. Costello, Noah D. Schoof, Ian C. Lenke, Alexandra M. Schiavoni, Ashley E. Holtz. The goal of our honors project is to organize, facilitate, and carry out an inclusive formal dance for disabled individuals in the Dubuque community. We chose this project after witnessing the benefits of events such as this one in our own communities. The dance will be on March 8th, and it is available free of charge to citizens with disabilities and their loved ones. We have worked closely with Goodwill, Area Residential Care, and Dubuque Community Schools to invite community members and meet the needs of those attending. We have also partnered with the eDUcation club on campus to bring this event to fruition. We will be able to share the process of putting the event together, the challenges that we encountered, the success of the event, and how we want to improve it for next year on our poster. (Mentor: Matthew J. Garrett)

Replication of "A Bad Taste in the Mouth: Gustatory Disgust Influences Moral Judgment: Rebecca A. Edwards, Samuel J. Rogers, Gabriela M. Hernandez, Melanie M. Szyperski. This study is a replication of Eskine, Kacinik & Prinz (2011). The purpose was explore the effect that one’s taste perception has on moral judgments. Participants were randomly assigned to one of three conditions, with different beverages. The three conditions were bitter, sweet, or neutral (water). Participants drank one teaspoon of their assigned beverage at both the beginning and halfway point of the study. Following this, participants were asked to read a series of vignettes and rate the characters on their morality. After participants completed the moral vignettes, they were asked to engage in a distractor task followed by a manipulation check to ensure that participants were not aware of the study’s true purpose. They will also be asked to describe their political beliefs (conservative, liberal, independent, libertarian, etc). We expect to find that drinking a bitter beverage will result in harsher moral judgments. We hypothesized that conservatives, as opposed to liberals, will judge the moral scenarios more critically. We hope that this research provides us with insight on the many factors that can influence one’s moral judgments, mainly beverage choices and political orientation. (Mentor: Julia S. Omarzu)

Box-Office Movies and the Economy: Reflection or Causation?: Regan Wolverton. Box-Office Movies and the Economy: Reflection or Causation? The purpose of this research is to determine if popular box-office movie genres reflect or cause the changes seen in societal perception about the state of the economy. I will collect various pieces of data including GDP of the United States in the last 15 to 20 years, ticket sales of popular movies by genres during those years, economic growth rate in the United States, and average real income spent on entertainment in a model. Events that were happening in the United States and the world before, during, and after the time of production; as well as what the movies industry does for the economy of the United States. Movies are a powerful reflection of how society perceives the world, thus a strong relationship is expected. (Mentor: Jennifer J. Smith)

"Love without Borders": Renata Veljacic. This piece was inspired by my final assignment given in my Intermediate Spanish class. I proposed to create a mural as we spoke about current politics, culture, identity, and expression through art in Chicago within my class. The assignment was to include everything that we have discussed in class that included, politics, the recent election, art, history, culture, and murals in neighborhoods of Chicago. Personally, I am more familiar with expressing myself through art rather than words and I was able to incorporate my experiences and observations of society into this piece. The following mural depicts representations of American,
Mexican, and Puerto Rican culture as well as societal views on different ethnic groups. We often see that there are many misconceptions about different groups of people. This piece may be interpreted in many ways, but that is the beauty of art, it can be seen in many different ways.  (Mentor: Dana J. Livingston)

**Immigrant Identity and Civic Engagement:** *Tanner Emerson.* This research examines the influence of anti-immigration legislation, and the social protests against it, on immigrant perceptions of racial identity and feelings towards civic engagement in Dubuque, Iowa. Data from the National Latino Survey and the American Community Survey provided background on social protests against anti-immigration policy in 2006 (2006, Pew Research Center; 2006, United States Census Bureau). Earlier studies show that immigrant racial identity was heightened as a response to anti-immigration policies and pro-immigration social protests. It was also found that civic engagement within immigrant groups, like marches and protests, increased and remained consistent after the 2006 events. Using interview and focus group data, this study will look at immigrant self-reported experiences related to racial identity and feelings towards civic engagement in the Dubuque area. The expected findings of this research are that immigrants will feel a greater sense of identity within their racial group and positive feelings towards civic engagement in the United States in 2017. This research is important considering the impact mass movements and governmental policy have on individual identity and immigrants' willingness to participate in the community to which they have migrated.  (Mentor: Kathrin A. Parks)

**Sustainability in the Sky:** *Ervin W. Yahr, Dylan M. Lange, Sarah J. Mueller, Taylor G. Brooks.* Our aim is to advance the development of grasslands and other ecosystems on Loras College campus with the long-term goal of creating a more sustainable environment for the native species found there. Specifically, we are focused on the predatory birds that call our campus and the surrounding areas home. Among these include red-tailed hawks, screech owls, a great horned owl, and coopers hawks. An increase in grassland will in turn increase available prey for these birds. Another long-term facet of our project is creating nesting spaces for these birds. An example would be small boxes mounted upon trees in which screech owls could nest. Sustainability is the main focus of our project, and we are striving to follow the land ethic established by Aldo Leopold.  (Mentor: Jacob M. Kohlhaas)

**Effectiveness of Continuous Glucose Monitoring in Subjects with Type 1 Diabetes:** *Taylor Meyer.* For my Pathophysiology class, I was assigned a project in which the purpose was to create a CAT (critically appraised topic). For this, I conducted research on continuous glucose monitoring. I formed a PICO question to conduct my research. The clinical question was "While using a sensor, what are the effects of continuous glucose monitoring on subjects with type 1 diabetes?" I found the effects to be very positive on these patients. A1C levels in almost all studies showed a significant lowering from baseline. This is a huge advancement in today's medicine, and can be used to help ease the lives of patients with type 1 diabetes.  (Mentor: Nathan D. Newman)

**Marketing Research Final Project:** *Therese Schultz, Jeffrey W. Bentley, Kylie C. DeWees, Tara A. Blake, Dylan M. Jacobs, Alison E. Reeg.* During our marketing research class, Fall 2016, our class completed a marketing research project for a "client", Holy Family Catholic Schools. We learned that their marketing team needed help on determining what families seek in a catholic school. We concluded that there are
positive and negative outlooks on the school system, and overall helped them realize ways to increase enrollments. (Mentor: Pat W. Marzofka)

**Assessing and Validating a 3D Motion Tracking Balance Assessment:** Thomas A. Johnson, Angela M. Richardson. Assessing and validating a 3D motion tracking balance assessment. Johnson, T., Richardson, A., & Kurczek, J. Balance is a sensitive marker of neurological insult. However, the current “gold-standard” for assessing balance ability, the Balance Error Scoring System (BESS) does not provide balance ability information on those who do not have dysfunctional impairments. This is problematic as the BESS is generally used with athletes, who should have better than average balance abilities, as a pre-post-measure of concussion assessment. In the present experiment, we look to compare the BESS test to a modified BESS that uses a 3D motion capture system to provide more sensitive information on body positioning. By identifying potential flaws in the BESS, we may reveal the need for other methods that could be used to identify individuals who have actually sustained a concussion. Loras College students were invited to participate in this study and randomized to a counterbalanced condition of the BESS and 3D motion assessment. Finally, they rated themselves on their balance ability. We found no relationship in subjective balance assessment and BESS scores. A more sensitive balance test could more accurately assess balance performance and better detect balance impairments in highly trained athletes. (Mentor: Jake C. Kurczek)

**Perturbations Observed in the Orbital Elements of the Spectroscopic Binary 57 Cygni:** Zachary Jeffries, Zachary D. Jeffries, Kenneth W. McLaughlin. We present spectroscopy confirming repetitive Doppler-shifts and photometry confirming no eclipses in the double-line spectroscopic binary 57 Cygni. Our spectroscopy is limited to a range encompassing H-alpha and the helium 667.8 nm line. Doppler-shifts of both stars were well-resolved in the helium line but less so in H-alpha. Although we find the radial velocities derived from both lines reasonably consistent we retained only the helium-line derived velocities for sinusoidal curve-fits to the orbital dependence. The fit-amplitudes specify the ratio of the stellar masses as 1.03 +/- 0.05, a ratio that is in agreement with previous assessments. We find an eccentricity of 0.028 +/- 0.024 and a longitude of periastron of 163.5 +/- 2.5 degrees; the former is significantly lower than that previously reported while the latter is in agreement but calls into question the apsidal motion predicted four decades ago. Our modeling suggests the presence of an external third body was implicit in this reported apsidal motion, as well as the most likely mechanism for our observed variation in eccentricity. Based upon the spectral type assignment, the near-circular orbit and the established mass ratio, we can place restrictions on the orbital inclination from 51.5-to-53.0 degrees, in reasonable agreement with previous estimates. (Mentor: Kenneth W. McLaughlin)

**Analysis of Photometric and Spectroscopic Observations of Binary Star System Algol:** Zachary Schroeder. Algol, also known as β-Persei, is a well-studied binary star system within the constellation Perseus. A binary star system is a system with two stars orbiting the combined center-of-mass for the system. We have collected data on Algol over a two year period using both spectroscopy and photometry. Our photometry confirms the reduction in starlight associated with the eclipsing previously observed for this binary system and our timing of its repetition agrees with the previously reported period of this orbital motion. Our spectroscopy confirms the elemental composition of the stellar atmospheres previously reported and finds repetitive Doppler shifts due to the orbital motion that allows us to infer orbital
speeds and radii; the associated centripetal acceleration allows us to infer stellar masses. Modeling based upon the Stefan-Boltzmann law allows us to infer stellar temperatures. Our stellar and orbital parameters are in reasonable agreement with those previously reported, confirming the proposed model of a significant transfer of mass between the stars.  

(Mentor: Kenneth W. McLaughlin)

**Using the Three Point Bend Test to Find the Best Strength-to-Weight Ratio by Testing the Varying Settings of Our 3D Printers**: Zachery Lindstrom. This project consists of making several different beams out of PLA plastic using our MakerBot Replicator 3D printers and using the three point bending test on the Pasco Materials Testing System. The goal of this experiment is to see what the different variations of print settings on our printer influence the overall characteristics of the print. The different settings tested were the orientation of the print, which is printing the object side to side, front to back, or vertically on the print-plate, percent infill, which is the percentage of how solid the print will be, and number of shells, which is the number of outer layers printed before filling in the middle of the object. The most important result to find is the strength-to-weight ratio. By finding an ideal ratio (low weight, high amount of strength) then we would be able to print objects at a lower weight, (using less material and saving money) without having to sacrifice the strength of an object being printed. After weighing each beam, they were loaded into the Pasco Comprehensive Materials Testing System and using the Three Point Bending lab off of Pasco’s website as a template, these beams were bended until they snapped, showing us their ultimate strength, or the maximum amount of Newtons achieved before the snapping occurred. Some significant findings were that the orientation at which a beam was printed, even though all other variables were the same, there was a difference in weight. Printing vertically seemed to be the heaviest print orientation while printing front to back was the lightest. Print orientation also had a difference in resulting strength values with the vertical print orientation being the weakest. The final beam, which was printed at 100% infill and 15 shells, was not the heaviest but achieved the highest strength of over 4000 N before snapping.  

(Mentor: Kristen A. Thompson)