IDEAFEST 2017
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<td>AEC Center (Lower level)</td>
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<td>Hybrid Stump Cutter Adam Howerzyl, Spencer Fynaardt, Austin Ver Meer, Josh Van Gorp</td>
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<td>Emily’s Secret: A Story of Love in the Highlands Matthew Augustine</td>
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<td>The Effect of Immigration on Agriculture and Rural Communities Ben Brockmueller</td>
<td>Portfolio of Genetic Diseases in Cattle Jessica Cheney</td>
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<td>Steel Bridge Competition Jose Benitez, Joas Bies, Jalissa DeHaan (see①below for more names)</td>
<td>Spike Force 3.0 Boone DeKramer, Chad DeGraaf, Dylan Schmitz, Glen Thompson</td>
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<td>Designing a Teaching Sculpture Kelli Johnston, Brenna Veltkamp, Jake Thayer</td>
<td>Church Giving Trak Dylan Vander Berg</td>
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① Andrew Yoon, Kent Te Velde, Yannick Habimana, Enoch Arikio, Ryan Pasveer, Kyle Reitsma
② Lindsay Ewald, Anne Wright, Caitie Fagen, Nathan Struyk, Brett Randolf, Miranda Moss
③ Jordan Peters, Dylan Bartles, Nathan Struyk, Neil Brower, Sarah Grubbs
Posters / Displays / Exhibits

On display in the De Yager Activity Center from 1:00 – 2:30

Presenters will be available from 1:15 – 2:15

Pizza will be served in the Campus Center Main Entrance

Please limit yourself to one slice

Thank You’s

Students – For presenting
Faculty – For mentoring
Cindy Nederhoff – For all the behind-the-scenes work
Campus Events Office – For coordinating the use of facilities
Computer Services – For the use and set-up assistance of Laptops
Library – For reserving all the equipment for our use
Sound Technicians – For handling sound systems
Maintenance – For set-up and tear-down of rooms
Dordt Dining – For making the awesome pizza
Copy Center – For printing the program
All Seasons Center – For the use of the poster display panels

Moderators

Josiah Wallace  Rev. Michael Ten Haken  Walker Cosgrove  Bruce Kuiper
Dick Joerger  Mr. Jim Den Ouden  Dave Mulder  Mark Tazelaar
John Olthoff  Mr. Bill Bokhoven  Tony Jelsma  Barb Hoekstra
Val Zonnefeld  Rev. Glenn Gerdes  Jan van Vliet  Leendert Van Beek
Duane Bajema  Dr. Rich Mouw  Mary Dengler  Mark Volkers
Tom Prinsen  Rev. Sid Couperus  Mike Janssen  Jenni Breems
Josh Matthews  Mrs. Marlys Hickox  Tom Clark  Jay Shim
1:00 PM Presentations

Library – Kuyper Scholars Room

**STEMM Solar Powered Water Pump**

Ryan Christensen, Nick VanderKooi, Sean Quinlan – Faculty Sponsor: Nolan Van Gaalen

Our senior design team worked with Siouxland Tanzania Education Medical Ministries (STEMM) to create a solar system capable of powering their agricultural pump. The STEMM compound, near Arusha, Tanzania, has struggled with sustainable agriculture due to their limited water supply. Designing a solar system to power their pump provides them with a reliable supply of water for the agricultural endeavors.

**CC318**

*Evaluating the Relationship Between Estimation Ability and Course Success*

Michal Huizenga – Faculty Sponsor: Val Zonnefeld

This research is a follow up study of Robert Siegler’s study on the predictive ability of number magnitude for elementary students’ mathematical ability. In this presentation I will share the results of a parallel study conducted at Dordt College which examined the connections in statistics by comparing college students’ ability to estimate correlation coefficients on scatter plots with their success in the course. My presentation will share my findings as well as discuss methods of teaching correlation coefficients in the high school classroom.

**CC319**

*Concrete Canoe*

Bryan Van Belle, Ryan Pasveer, David Davelaar, Ryan Ruenholl, Amelia Rens, Mykaela Ptacek – Faculty Sponsor: Justin Vander Werff

The Concrete Canoe Club is an engineering based, multidisciplinary club that builds a canoe out of concrete. We work throughout the entire year to design a new concrete shape and mixes. Using a variety of unique aggregates, our canoe is light enough to float in the water, even with the weight of paddlers. Our canoe is raced against other Midwest schools for a chance to go to the National Competition.

Library – AEC Center

**Urban Education**

Karli Laninga – Faculty Sponsor: Barb Hoekstra

I recently created a website to display my interest in urban education, my research findings, and an interview I did with someone who works in an urban school. I wanted to learn more about poverty in schools and teaching in inner city schools, because I feel drawn to these environments and could see myself teaching in schools like this if I were called. Urban schools need motivated and invested teachers who are willing to put in the work to provide a safe, loving, and rigorous learning environment for students.

Eckardt Lounge

**A Review of a New Testament Independent Study**

Matthew Bolt, Andrew Koetsier – Faculty Sponsor: Aaron Baart

This semester we decided to take a more in-depth look at some books from the New Testament, focusing on Matthew and Romans. Not only was this study beneficial for learning how to read the Bible and becoming more familiar with its contents, but the spiritual growth made during this time was certainly beyond what we expected. Our presentation will include our outline of study, the main themes we learned from the text, and our opinions on the importance of spending time in the Bible and how to get make the most of daily devotions.
Corruption in the Developing World
Joshua Meribole – Faculty Sponsor: Kristin Van De Griend
One of the hindrances to the development of the developing world is corruption. So why does it exist? And how can it be dealt with? What causes government officials to be corruption and to lack concern of their people? Looking at corruption in African countries and countries in South America, we can first understand the root of corruption as well as learn different methods to help countries deal with their corruption.

1:15 PM Presentations

Library – Kuyper Scholars Room
Old Testament Violence and White Supremacy
Carlye Tazelaar – Faculty Sponsor: Ben Lappenga
This video compares the forms of violence portrayed in the Bible to the issues of violence that exist today, specifically the violence against black people in America waged by white supremacists.

CC318
Air Compressor Design
Jacob Moats, Michael Grady – Faculty Sponsor: Ben Saarloos
This is a Senior Engineer Design project with CIVCO Radiotherapy. We designed a new rotary vane pump to be used with their vac-lok bag system, to ensure patient positioning during radiation treatment.

CC319
Pronouns and Articles: Analyzing the Linguistic Intelligence of U.S. Presidents
Meagan DeGraaf – Faculty Sponsor: Bob De Smith
In assessing speech patterns and word use, a basic understanding of linguistic intelligence emerges. This presentation explores how the use of certain words determine this intelligence level. It will focus on the linguistic analysis of speeches given by presidents of the United States, focusing on the shift in article and pronoun use over history to understand the personalities and leadership styles of presidents through their word choice.

Library – AEC Center
Refugees: Getting an Education in an Unknown World
Abby Zollinger – Faculty Sponsor: Barb Hoekstra
What is the state and quality of education available to refugee children? I’ll explore why this is an important issue in the world, why we should care, and what we can do about it.

Eckardt Lounge
Teacher Inquiry Project: Phonemic Awareness
Karina Heynen – Faculty Sponsor: Pat Kornelis
My Teacher Inquiry Project was with a 5th grade student who is a strong reader but struggles with phonemic awareness affecting her fluency. I used the Read Naturally program for 6 weeks, meeting three times a week with fifteen minute sessions, with the intention of increasing phonemic awareness and therefore her fluency. My goal was for my student to increase her words per minutes by 30. This presentation will share the results of this intervention.
**Library – Reading Café**

**Does Horror Shape Humor? Connecting the World Wars with Funny Novels**

Emily Wicker, Julia Brollier – Faculty Sponsor: Josh Matthews

When most people think of a funny novel, they think of a laugh-out-loud, gut-busting, rolling-on-the-floor page-turner. However, as we discovered in our Reading for Life class on very funny novels, humor has many definitions – and not all of them are “funny”. This presentation concludes a group study of six different humorous novels, three from British authors and three from American authors. We will examine the ways in which different wars affected these authors, ideas of humor.

**Library – TRC**

**Combinatorics, Computing, and Rulers**

Thomas Kamp, Jay Timmer – Faculty Sponsor: Tom Clark

A standard 12-inch ruler has 11 tick marks and can be used to measure any length between 0 and 12. However, how many of these tick marks are actually necessary? If we remove one tick mark, it is clearly still possible to measure all lengths. What if we remove 2 or 3 tick marks? In actuality, we can remove 7 tick marks! But what about rulers of other lengths? In this project, we sought to find some formula that can predict the minimal number of tick marks needed for any ruler by using our knowledge of combinatorics and programming.

**1:30 PM Presentations**

**Library – Kuyper Scholars Room**

**Assessing Learning in Music**

Sion Yang – Faculty Sponsor: Bradley Miedema

Why does participation get you an automatic A in music, when it is not an acceptable standard for grading other core subject areas? This absurd phenomenon results from the lack of a structured assessment system. Assessment is an integral part of teaching and learning because it not only informs of students their strong and weak areas in a subject, but also helps teachers adjust their instructional methods and pace of teaching according to the information they gather from student assessments. Recognized as a core curricular subject by the No Child Left Behind Act, music deserves a carefully structured assessment system.

**CC318**

**Las Arpilleras and the Chilean Revolution**

Jordan Kooima – Faculty Sponsor: Rikki Heldt

Las arpilleras are embroidered quilts that tell the story of what was happening in Chile during the revolution between 1972-1990. These were women's visual responses to the dictator and the revolution. The presentation also shows how the revolution began, who was involved, more information about las arpilleras, and what Chile is like today.

**CC319**

**Cardiovascular System Model**

Stephanie Pausma, Rebekah De Penning, Eric Rowe, Josh Susman – Faculty Sponsor: Kayt Frisch

We designed a physical model for the nursing department for use in teaching the cardiovascular system. The value of this model lies in its ability to show changes in measurements that parallel the measurements that nurses will need to make in the course of their career. This presentation will showcase the design process and the technical steps we have taken to build and test a prototype that accomplishes the physical model goals.
Library – AEC Center

*Computers Playing Super Mario Bros.: Machine Learning & Genetic Algorithms*

Jeremy Klyn – Faculty Sponsor: Nick Breems

Machine learning is a rapidly expanding area of computer science through applications such as driverless vehicles and search engine optimization. "Teaching" a computer to play *Super Mario Bros. 3* models an application of machine learning and the problems that must be solved: capturing and processing data meant for human interpretation, finding patterns in that data through some algorithms, and using those patterns to create optimal solutions. This project focuses on the use of genetic algorithms for a type of machine learning, where the optimal solution is a successful play-through of *Super Mario Bros. 3*.

Eckardt Lounge

*How Lin Manuel Miranda Changed Theatre*

Andrea Squiers – Faculty Sponsor: Teresa Ter Haar

Lin Manuel Miranda wrote the musical *Hamilton* over the course of seven years. This musical has changed how theatrical productions can be produced with many different styles in one show. I explored why Miranda wrote the show the way he did (changing some historical facts), writing many music genres within one show, and the popularity of the show as a whole.

Library – Reading Café

*Early Christian Responses to Persecution*

Jordan Swanson – Faculty Sponsor: Scott Culpepper

How do ideas develop? Are ideas merely the result of intellectuals building off each other's progress, or are they formed in response to the events surrounding them? This paper argues that, in the case of examining early Christian apologetics, the latter is true. Christian responses to persecution were shaped in reaction to their own situations they faced.

Library – TRC

*The New Cuba Policy*

Christopher Fried-Ochoa – Faculty Sponsor: Kristin Van De Griend

"The New Cuba Policy" is a systematic policy analysis that explores the historical context leading to the ability of the United States to actively seek an end to the embargo that has been placed on Cuba since 1960. The presentation will also present arguments that support ending the embargo and what may come in the new chapter of US-Cuba relations.

1:45 PM Presentations

Library – Kuyper Scholars Room

*Meaningful Math*

Lauren Vermeer – Faculty Sponsor: Kathleen VanTol

My intervention plan, as a component of the year-long student teacher internship, targeted the math skills of a third grade student to increase multiplication fluency through personalized instruction. Through interactive learning experiences and sports-related games, fluency increased from 4 correctly answered problems to 19 correctly answered problems in a minute. This experience shows the effect that personalized and enjoyable activities have on a student's learning.
**Expression and Analysis: Connections between Math and English in School**  
Kinza Brue – Faculty Sponsor: Val Zonnefeld  
Math is often a very divisive subject – either students love it or they hate it. Part of changing the attitude towards math includes changing the view of math from a memorization of procedures and rules to a creative and active process – framing math similarly to other subjects such as English. Often such subjects are set up as opposites of one another – math is for numbers people and English is for words people. However, the connections between Math and ELA are numerous. This presentation will explore some of the ways these two disciplines can overlap and support each other.

**Investigating the History of English**  
Katie Kooiman, Haley Moss, Anna Jordan – Faculty Sponsor: Bob De Smith  
Our panel will explore the influence of other languages on English. Languages to be considered will be French, Dutch and Italian.

**Is History Just a Class?**  
Rebekah Greidanus – Faculty Sponsor: Barb Hoekstra  
As far back as I can remember, history has been the class that I would rather nap in than invest in. I was shaken from this mindset upon my first semester of core 140 with Dr. Cosgrove. With each toss of his marker, he threw my perspective into a tailspin. His passion and persistent questioning of perspectives planted the first seeds of questioning within me. What if history is, in fact, interesting and relevant? How can understanding an individual's history ultimately serve them.

**Spanish Independent Study Review**  
Matthew Bolt – Faculty Sponsor: Rikki Heldt  
This semester I spent some time watching a Spanish telenovela, reading various articles, reviewing grammar structures, and studying new vocabulary. I will be reviewing my progress, describing what I learned, and giving advice to other Spanish students about successful methods of studying Spanish. **This presentation will be in Spanish.**

**Gods of Greece, and Men**  
Michel Gomes – Faculty Sponsor: Walker Cosgrove  
This paper surveys three influential Greek writers – Hesiod, Homer, and Aeschylus – and studies the evolution of men's perception of the self and the gods. The thesis defends that as Greek culture matured, gods went from being rudimentary elemental forces, to becoming almost an allegorical substantiation of men's passions.

Don’t forget to check out the Posters & Displays in the De Yager Activity Area
Facing the Right Direction
Brooke Granstra – Faculty Sponsor: Pat Kornelis
A common error among first grade students is the reversals of letter sequence and letter orientation. Handwriting instruction is designed to help prevent reversals, but students who struggle with reversals often become frustrated and decrease in persistence and in motivation. This research study explored the enhancement of letter formation. Over a four-week period I worked with four low performing students: two boys and two girls implementing the researched strategy of working with engaging actives to improve letter memory. Students’ growth was monitored through a pre and post assessment.

2:00 PM Presentations

Hybrid Stump Cutter
Adam Howerzyl, Josh Van Gorp, Austin Ver Meer, Spencer Fynaardt – Faculty Sponsor: Ethan Brue
Our Senior Engineer Design team has been working collaboratively with Vermeer Corporation in Pella, Iowa on a preliminary design of a Hybrid Stump Cutter. We plan to present our initial scope/challenge and the progress we made throughout the year.

The Impact of Chest Protector Energy Absorption on Commotio Cordis
Rebekah De Penning, Jason Seely – Faculty Sponsor: Kayt Frisch
Commotio cordis is a form of heart attack that can occur when an impact occurs over the heart at a specific moment in the cardiac cycle. It is most common in young men who play sports like baseball or lacrosse. Chest protectors are being developed to help protect young athletes. The purpose of this research project is to characterize the energy absorption ability of the different foams under consideration, and to identify trends between energy absorption and the prevention of ventricular fibrillation.

From Oddities to “an Overwhelming” 13%: Women in the Engineering Workforce
Bridget Pertzsch – Faculty Sponsor: Barb Hoekstra
Historically, engineering has been viewed as a profession for men. Throughout the first part of the twentieth century, women in the field were rarities. However, with the onset of World War II, a group of women began to work as engineers and drafters, although this trend did not continue. Over time, more women have entered engineering, but the percentage of female undergraduate engineering students has remained virtually unchanged over the last two decades, and statistically one-third will leave the field within ten years. It might be time to change the approaches taken to support success in the field.

Walt Whitman and the Civil War
Alexandra Rexford – Faculty Sponsor: Paul Fessler
An examination of Walt Whitman’s works, specifically how his writings were effected by the Civil War.
Eckardt Lounge

Dordt Recycles

Renee Ewald, Elayne Apol, Josh Heynen, Lindsay Mouw, Lindsay Ewald, Anne Wright, Caitie Fagen, Nathan Struyk, Brett Randolf, Miranda Moss – Faculty Sponsor: Jeff Ploegstra
The Sustainability Committee, an amalgam of students from all classes and majors, kick started Dordt's first official recycling program on December 1, 2016 as a part of the annual December Service Project. We learned valuable lessons about community development, human behavior, and project implementation. We will share what worked, did not work, and our vision for the future.

Library – Reading Café

The Roman Roads: An Enduring Monument
Levi Niesen – Faculty Sponsor: Walker Cosgrove
The Roman Roads are an overlooked monument from a powerful civilization. The road system was the first of its kind, covering approximately two hundred and fifty thousand miles – with fifty thousand of those being paved. Covering the civilized world like a web, the roads allowed Roman influence to spread throughout and unify the empire. Rome’s engineers, with quality and efficiency in mind, conquered the plains, mountains and marshes. The roads symbolized the strength and unity of Rome, and their durability requires that they be recognized as a testament to the ingenuity of the Roman engineers.

Library – TRC

Social Critique of Pamela, Jane Eyre, & Tess of the d'Urbervilles
Breanna Kooiman – Faculty Sponsor: Mary Dengler
I will be critiquing the social aspects of the literary works Pamela, Jane Eyre, and Tess of the d'Urbervilles. Though these novels all include a female protagonist, each female responds very differently to the customs and conventions of society. Does nature or nurture play a more significant role in their decisions and worldviews?

2:15 PM Presentations

Library – Kuyper Scholars Room

The Biological and Cultural Impacts of Birth Control
Elizabeth Rankin – Faculty Sponsor: Tony Jelsma
Birth control, a common practice used today, is influential on an intimate and personal level in both a biological and emotional aspect. This practice impacts not only individuals within our country, but also the culture of United States as a whole. In this presentation, various options of birth control will be addressed along with potential concerns, myths, and unknown truths.

CC318

Bridge Load Stress Display System
Hyunmyeong Goo, Sam Van Bruggen, Cheonghun Kim – Faculty Sponsor: Ben Saarloos
Teaching aids have always been great tools to help students understand concepts through visual observation. They allow students to physically manipulate a medium in order to see what responses occur, which is far more beneficial than just lecturing alone. We created a visual aid that Dordt professors could use to give students conceptual knowledge of how a load on a bridge translates to strain in its trusses.
**CC319**

**6 Key Elements to Teach Students from Low Economic Backgrounds**

Jazmin Arami Mendieta Gauto – Faculty Sponsor: Barb Hoekstra

The title explains itself: 6 Key elements to teach students from low economic backgrounds. This project presents six practical ideas that can be used in a classroom setting to motivate, encourage, lead, and teach students who are being affected by the issues of living in poverty. These elements include: Establishing a community; teaching the basics that were not taught at home; building a collaborative classroom; working with what students already know; motivating students; and going the extra mile.

**Eckardt Lounge**

**Political Factors in Puerto Rico’s Debt Crisis**

Caeden Tinklenberg – Faculty Sponsors: Jeff Ploegstra, Rikki Heldt

The roughly 3.5 million residents of Puerto Rico face many challenges and critical decisions in the near future. The US territory is accustomed to such challenges which have plagued the island for much of its recorded history. The flagship issue for the past 100 years has been the political status of the Island. More recently, the Puerto Rican government finds itself struggling to remain afloat with $70 billion in public debt that has already begun to default. How do these issues relate to each other and what might the future of Puerto Rico look like?

**Library – Reading Café**

**Imperfect, Impermanent, Incomplete: Wabi Sabi**

Michel Gomes – Faculty Sponsor: Mark Tazelaar

The rise of the businessmen has led popular culture to idolize the perfect and the efficient. A person, or an object without a tailored purpose, without a clear direction, is often regarded as somewhat insufficient to both the self and society. Is that the best way to approach life though? Is there beauty in what is broken? Can there be beauty in my depression? Wabi Sabi is a traditional Japanese concept of aesthetics, that proposes acceptance of transience and imperfection. How then can a concept of art translate into life?

**Library – TRC**

**What are You Laughing at?: A Study of Comedy in Theatre**

Josh Bootsma – Faculty Sponsor: Teresa Ter Haar

This presentation is an examination of what makes us laugh in the art of theatre, focusing on Peter McGraw's benign violations theory to explain humor. Thought will be given to how this theory applies to various types of onstage comedy throughout history as well as potential shortcomings of the theory.

**Library – AEC Center**

**Reading Intervention**

Jenae Bundick – Faculty Sponsor: Barb Hoekstra

The purpose of this intervention was to support two struggling readers in my kindergarten class in order to build their proficiency of basic literary skills such as letter recognition, letter identification, and letter sounds. Both of these students still struggled significantly in the most basic areas of phonemic awareness. This hindered their independence throughout many learning experiences, resulting in a widening gap in their learning. Most of their peers at the time were engaging in writing narratives, opinion essays, and creative stories. I planned to provide a fifteen-minute intervention five times a week for four weeks with each of these individuals. The goal was to increase their phonemic awareness and identify additional and specific needs through using research-based strategies. Because of these interventions and techniques that were used, both students experienced progress.
2:30 PM Presentations

Library – Kuyper Scholars Room

Hometown: an Exploration of Memory, Place, and Time
Shelbi Gesch – Faculty Sponsor: Howard Schaap
I plan to read parts of a piece I'm writing for my independent study project, a series of related essays centered in a place – Glenwood, Iowa. In my writing, I explore the way memory changes over time through my own relationship to my family's "hometown," as I've learned to reclaim it as my own and find beauty in a place that I previously associated with painful memories.

CC318
Playing with the Rules
Josie Vander Stoep – Faculty Sponsor: Pat Kornelis
The basis of my project looks at how games can improve spelling. My 5th grade students struggle with spelling, so I decided to turn what they struggle with into a fun activity. My students loved the lessons and actually enjoyed learning spelling rules. I could see their confidence level rising in each lesson. As a result of learning and practicing spelling rules through games, my students’ knowledge of spelling rules improved.

CC319
Aerodynamics of Silphium Seed
Andrew Cammenga, Daniel Lucht, Mark Brauning – Faculty Sponsor: Kevin Timmer
Our project is to build a machine for The Land Institute that will quantify the aerodynamic property of Silphium seeds. They will use this data to selectively breed plants for better aerodynamics. This is aimed at addressing the problem of seed blowing out the back of a combine since it looks and acts just like chaff.

Eckardt Lounge

Restoration Plan of Buena Vista County Park
Lindsay Mouw, Katie Eshelman, Jordan Peters, Dylan Bartles, Nathan Struyk, Neil Brower, Sarah Grubbs – Faculty Sponsor: Robb De Haan
Over the course of the spring semester the Restoration Ecology class has put together a restoration plan for the Buena Vista County Park property. The project involves site analysis and restoration of several different ecosystems, control of invasive species, and improvement of recreational and educational opportunities. As Christians, we are called to restore every aspect of creation; this project dives directly into the restorative work of endangered ecosystems.

Library – Reading Café

Geographic Literacy in the Classroom
Trevor Zonnefeld – Faculty Sponsor: Kathleen VanTol
Geographic Literacy has been declining. The need for geographic literacy, especially in a Social Studies class, is important, because history always happens somewhere. While teaching 8th Grade U.S. History, I found that many students did not know basic geographic locations within the United States, which was having a negative impact on not only their own, but also their classmates learning. I did a Targeted Intervention with a small group of three students to lessen the gap of geographic knowledge that is needed at the 8th Grade level.
Driving Safe, Aging Well
Holly Testerman – Faculty Sponsor: Bruce Kuiper
Although the elderly wish to retain their licenses in order to preserve their independence, they pose an increasing danger to society as they age and their driving skills decline. One solution is community car-pooling networks that allow seniors to maintain their dignity and vibrant social life while still traveling safely.

The Evolution of Courtship: From the Bildungsroman to Romantic Realism
Rachel Jensen – Faculty Sponsor: Mary Dengler
I’ll seek to show the similarities and differences between Jane Austen’s *Pride and Prejudice* and Emily Bronte’s *Wuthering Heights* concerning their views on courtship. More specifically, each author displays a different writing style according to the current events of her time, affecting her portrayal of romantic courtship, conflict, and resolutions.

Recycling in the U.S. and Sweden
Paige Ebbers – Faculty Sponsor: Rikki Heldt
Sweden is the world’s leading country in recycling efficiency. They use almost 99% of their waste and only about 1% ends up in the landfills. The United States on the other hand only recycles about 34% of their waste. This presentation explores the importance of recycling, the differences between Sweden’s and the United States’ recycling systems, and what both countries are doing to improve their respective recycling systems.

Fluency Frenzy
Morgan Van Hulzen – Faculty Sponsor: Pat Kornelis
Being able to read fluently is an important skill in any student’s reading life. While some students are naturally fast and fluent readers, others find it a moment of panic when AECed to read a passage accurately, quickly, and with expression. For some, it is a frenzy. Reading fluently is important because it provides a bridge that connects comprehension to word recognition. One way to improve a student’s fluency is to practice cold reads and hot reads.

Wisdom or Foolishness: An Analysis of the 2016 Canadian Federal Budget
Levi Minderhoud – Faculty Sponsor: Jan van Vliet
In the wake of a mild recession in 2015, a precipitous drop in oil price and global uncertainty, the Canadian economy has been growing at a very lackluster pace. In order to try to stimulate current economic activity and prepare the country for the future, the Liberal government introduced a $29.4 billion deficit in their 2016 federal budget. I’ll examine the economic arguments in favour of and in opposition to this deficit spending and conclusively decide whether the government’s fiscal policy is wise or not.
The Blessing of Ignorance

Jose Benitez – Faculty Sponsor: Howard Schaap
This paper is an attempt to start a dialogue about the possible roots of corruption in Paraguay. The relationship between historical, political, and current social situations are discussed to understand the current corruption situation in Paraguay.

Developing Purpose in Journalism

Caeden Tinklenberg – Faculty Sponsor: Lee Pitts
Journalism has seemingly decreased in quality over the past ten years. Social media has volatilized news by creating a platform for instant circulation. Centralized ownership has increased the polarity and bias of agencies. Lack of integrity in the press and consequential charges of "fake news" have lost the trust of many everyday Americans. In many ways, we live in a "post-fact world." What purpose can journalism have in reversing this trend and how does a small Christian college prepare students for the challenge?

Materialism and the Soul

Lydia Marcus, Tairin Van Tol – Faculty Sponsor: Mark Tazelaar
Science often depends on materialistic reductionism to explain natural phenomena, leaving very little room for discussion of the divine. Advances in neuroscience have demonstrated that physical processes can explain phenomena previously attributed to the non-physical soul. Souls are prevalent in Christian theology, so aspiring scientists must ponder materialism and the theology of souls. To some, neuroscience has replaced the non-physical aspect of humanity with reductionist explanations. To others, neuroscience has increased the need to replace body-soul dualism with integration of the body and soul. In this contract, we explore the compatibility between neurobiology and a faithful theology of souls.

Anxiety in Kindergarten

Kaly Hale – Faculty Sponsor: Barb Hoekstra
Five and six year-olds with anxiety? Yes. Anxiety disorders come in many forms, one being selective mutism. Through various educational strategies, I implemented a program for a Kindergartener at Kinsey Elementary with selective mutism. Selective mutism is a complex childhood anxiety disorder characterized by a child's inability to speak and communicate effectively in select social settings, such as school. These children are able to speak and communicate in settings where they are comfortable, secure, and relaxed. Through strategic instruction and restructuring of the classroom environment, this student made great progress.

Wind Tunnel Drag Module

Kolter Bradshaw, Mark Comfort, Timothy Rohda – Faculty Sponsor: Nathan Miller
We designed a module to test drag using the engineering department wind tunnel. Students will be able to use our design to measure the drag force for a variety of cross-sectional areas. The module will utilize mechanical and/or electrical means for data collection.
CC318
The Effect of Immigration on Agriculture and Rural Communities
Ben Brockmueller – Faculty Sponsor: Rikki Heldt
Immigration has continued to be a hot button issue in the United States. One area where immigration has made a significant economic and cultural impact is on the agricultural sector. This presentation seeks to examine why immigration is an issue, how it impacts agriculture in the United States, and its effect on local communities. As Christians, it is important to begin to develop a Christian response to how we interact with the topics of immigration and immigrants themselves.

CC319
Portfolio of Genetic Diseases in Cattle
Jessica Cheney – Faculty Sponsor: John Olthoff
New advancements in genetics has caused much to be discovered on various cattle diseases. This presentation will discuss a few of the more interesting diseases and their mode of inheritance in cattle. Each disease will be described with symptoms, treatments, genetic information, and other interesting knowledge on that disease accompanied by images of the impact of the disease on the animal.

Library – AEC Center
The Fidget Contract
Calvin Wunderink – Faculty Sponsor: Kathleen VanTol
A student with ADHD couldn’t focus and was always tapping his pencil. I made a contract, gave him a fidget tool, and gave him clear expectations. The goal was to help him focus by giving him a constructive way to use his hands. I have data and results showing that it mostly did not work, as well as a possible explanation why.

Eckardt Lounge
Jazz in the 1920s: The Contrasting Motivations Behind the Responses of the Nation and Sioux County
Karissa Van Surksum – Faculty Sponsor: Paul Fessler
The rise of jazz music in the 1920’s represented much more than just a new form of music. To many Americans, it embodied the cultural shifts occurring in the 1920’s--by its nature, jazz rebelled against traditional forms of music as this new modern generation rebelled against the traditional lifestyle and moral standards. Many Americans were discussing jazz in various ways, but ultimately, they responded based on their acceptance or fear of the coming social shifts. Sioux County is an interesting case study because they, too, accepted and rejected jazz, but for different reasons than the nation in general.

Library – Reading Café
An In-depth Study of Anthrax and its Social Implications
Lilly Smith – Faculty Sponsor: Duane Bajema
Anthrax has been impacting the agricultural world for thousands of years, however due to lack of sufficient data, the affected number is unknown. Because of this, the risks associated with the disease are partially ignored. My research over this semester has centered on the social implications of this disease, its impact on the agricultural world, and its impact on the developed nations by means of bioterrorism.

Library – TRC
Trendsbians: The Meme of LGBTQ
Tara Tilstra – Faculty Sponsor: Mary Dengler
This presentation covers the wide history of LGBTQ within different eras and cultures. It looks into the responses that have been made towards this subculture over many centuries and in modern times. Further, the presentation seeks to encourage Christians to consider how they interact with this community, especially with a Reformed worldview.
3:15 PM Presentations

Library – Kuyper Scholars Room

A Lost Garden and A Lost Understanding
Nicolas Kuperus – Faculty Sponsor: Mark Verbruggen
John Walton’s book The Lost World of Adam and Eve offers profound insight into the nuances of the creational narrative. In addition to ideas about the mechanics of creation, Walton outlines important ideas about interpretation of the first chapters of Genesis, and the Bible as a whole. In a time of increasing division in society and even the church, this presentation seeks to offer ways to discuss issues surrounding creation in a civil and loving manner.

CC318

Steel Bridge Competition 2017
Jose Benitez, Joas Bies, Jalissa DeHaan, Andrew Yoon, Enoch Ariko, Kent Te Velde, Ryan Pasveer, Kyle Reitsma, Yannick Habimana. – Faculty Sponsor: Justin Vander Werff
We represented Dordt College in the ASCE Steel Bridge Competition. The project consisted in the design, manufacturing, and assembly of a 21ft-long steel bridge that is able to hold specified amounts of weight in multiple locations on the bridge. We competed – as the youngest team, with two freshmen and four sophomores – against eleven other schools. This year’s bridge improved in many aspects compared to last year’s. Among these are lightness, aesthetics, and building construction.

CC319

Spike Force 3.0
Boone DeKramer, Chad DeGraaf, Dylan Schmitz, Glen Thompson – Faculty Sponsor: Doug De Boer
An increase in volleyball-related shoulder injuries has sparked research interest into shoulder loading during a spike. Our project was to design a method by which the magnitude of the impact force from a volleyball spike on the hand can be measured to assist with continued research into the shoulder injuries volleyball players experience. Two solution methods were pursued. We developed a solution using the motion capture lab by using kinematic equations. The other solution required development of a circuit that determines the force of a spike on the hand from force sensors located on the hand.

Library – AEC Center

Teacher Inquiry Project: Sight Words
Rachel Louwerse – Faculty Sponsor: Kathleen VanTol
I worked one-on-one with a third grader who was placed on an IEP because he is reading at a first grade level. I put an intervention into place for this student to help build his bank of sight words so his weekly scores might improve when reading words in context.

Eckardt Lounge

An Interpretation of "You Are Special" by Max Lucado
Anna Christians – Faculty Sponsor: Bruce Kuiper
For the forensics event "Children's Literature Interpretation," I will be reading from the book You Are Special by Christian author, Max Lucado. In this book, the main character of the story, Punchinello, learns to embrace his identity after encountering his maker and realizing the love and design put into every created being. Facial expression, body language, and vocal emphasis are all key methods of interpretation for this piece.
**Library – Reading Café**

*The Effects on Swine Growth of Using Essential Oils in Feed*

**Andrea Borup, Devin Holesinger, Gretchen Rops** – Faculty Sponsor: Duane Bajema

The feeding trial was done with 100 feeder pigs divided into three treatment groups: a control, pelleted feed with essential oils, and ground feed with essential oils. The pigs were weighed biweekly, and the data collected was used to calculate feed efficiency and average daily gain. The biweekly weighing enabled the comparison of feed efficiency and average daily gain at different growth stages.

**Library – TRC**

*Sexual Equality in Middle School*

**Hannah Veldhuisen** – Faculty Sponsor: Barb Hoekstra

The subject of my presentation is Sexual Equality in Middle School, what causes it, and what teachers should do to promote it in their classrooms. My initial questions were, how is sexual inequality hindering students today? Why does it happen? What needs to be done? My most significant discovery was that Middle Schoolers are very difficult to read as they contradict themselves and are very confused about life. The best thing to do is take it slow, AEC questions, and give every student the same amount of love.

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**3:30 PM Presentations**

**Library – Kuyper Scholars Room**

*Emily's Secret: A Story of Love in the Highlands*

**Matthew Augustine** – Faculty Sponsors: Walker Cosgrove, Scott Culpepper

This is a (semi) historical short story I wrote about seventeenth century England. It details the trials and travails of Emily MacAngus during the war between Bonnie Prince Charlie – Stuart claimant to the English throne – and the British King. History majors so often go into teaching, and with this project I would like to show that there are other things we can do.

**CC318**

*Designing a Teaching Sculpture*

**Kelli Johnston, Breanna Veltkamp, Jake Thayer** – Faculty Sponsor: Justin Vander Werff

Our Senior Engineer Design project is a teaching tool for engineering professors to use in their classes. The idea is that students can have a chance for hands on learning and will be able to see what engineering looks like outside of the classroom. Students will be able to study different connections (welded and bolted) as well as the effects of compression and tension. They will be able to use the sculpture to draw shear and moment diagrams, calculate forces, and more.

**CC319**

*Church Giving Trak*

**Dylan Vander Berg** – Faculty Sponsor: Kari Sandouka

Church Giving Trak is a simple, easy-to-use software that keeps track of donations in a church. We created Church Giving Trak as a giving solution for churches who have previously been intimidated by complex software. We have also added an online donations module to allow church members to give at their convenience. Church Giving Trak began as a simple exercise to introduce myself to web development but has grown to a full blown product that has hit the market. Additional info can be found at churchgivingtrak.com
Love, Paste, Shame, and a Deep Lack of Empathy
DaNae Van't Hul – Faculty Sponsor: Bruce Kuiper
For the forensics event "After Dinner Speaking," I will be reviewing the new ways people are breaking up with each other, especially via text messages. This event focuses on use of persuasive messages, application of humor, and effective expressiveness to help communicate a central message. In today’s world, new technology might make it easier to end a relationship, but does the method sometimes cause even more stress?

Posters/Displays – on display 1:00 – 2:30 in De Yager Activity Area

Presenters will be available to answer questions from 1:15 – 2:15

Anthropogenic Nitrogen and Practices Employed to Reduce Nitrogen Emissions in Corn and Soybean Agroecosystems Literature Review
Lydia Marcus – Faculty Sponsor: Carl Fictorie
For the last five decades, Midwestern farmers have relied on nitrogen-based fertilizers to produce billions of bushels of corn and soybeans each year. Agricultural nitrogen usage accounts for about 75% of reactive nitrogen anthropogenic activities which have significantly impacted the natural nitrogen cycle, approximately doubling the amount of reactive nitrogen available. This increase in nitrogen has serious consequences for ecosystems and human health. This review summarizes the nitrogen cycle, human influences on the nitrogen cycle, nitrogen in agroecosystems, consequences of elevated nitrogen levels, and best management practices that have been developed to mitigate nitrogen pollution.

Are Statins and Hormone Therapy Associated with Changes in Fatty Acid Levels? An Analysis of Data from the Women’s Health Initiative Study
Timothy Rohda, Andrew Cammenga – Faculty Sponsor: Nathan Tintle
The Women’s Health Initiative has been performing studies to determine if hormone therapy and hysterectomies affect fatty acid levels in women over 65. We will be focusing on if levels of omega 3 and omega 6 fatty acids are related to these treatments. Since fatty acid levels have an effect on a person’s health, a correlation between these treatments and fatty acid levels could help improve the health of women over the age of 65.

Backward Design
Renae DeWaard – Faculty Sponsors: Rikki Heldt, Kathleen Van Tol
Backward Design is a specific way of planning both lessons and units so as to best cover the goals of any given unit of study. Rather than fitting standards in around fun activities, you must plan fun activities around the standards, to ensure that the goal is met.
**Ball Contact Initiates Forearm Deceleration in a Volleyball Spike**

Glen Thompson, Dylan Schmitz – Faculty Sponsor: Kayt Frisch

Minimal research has noted the importance of analyzing the deceleration phase in volleyball. Escamilla et al. presented the idea that contacting the ball produces an equal and opposite direction that acts as the main deceleration of the arm during a spike. This study tests that hypothesis by measuring arm acceleration throughout the course of a volleyball spike to determine when the arm decelerates.

**Do High State and Trait Hopelessness Levels Predict Lower Home-based Exercise Participation in Patients with Coronary Heart Disease?**

Abbey Bos, Kayla Brouwer, Lexi Eekhoff – Faculty Sponsor: Nathan Tintle

Coronary heart disease is the leading cause of heart attack and affects millions of Americans every year. Studies have shown that exercise decreases risk of heart attack, and complex relationships with levels of hopelessness exist. We will look for a relationship between baseline hopelessness scores and whether or not the patient is more or less likely to participate in home and hospital exercises. We predict that a patient with a low baseline hopelessness is less likely to participate in prescribed exercise.

**E-stim and How it Works on the Body**

Danielle Stosuy, Kendra Polhman – Faculty Sponsor: Jeff Schouten

We will present the different effects of E-STIM and ways E-STIM can be used to treat pain or injuries.

**English Language Learners with Learning Disabilities**

Rachelle Riezebos – Faculty Sponsors: Rikki Heldt, Kathleen Van Tol

English Language Learners are a growing population in schools today. It is important for educators to know the best approaches in helping them not only adapt to American culture, but the American education system as well. This project focuses specifically on identifying English Language Learners with learning disabilities, and what teachers can do with students who are struggling to learn a second language.

**Epigenome-wide Association Study of SNP-CpG Interactions on Changes in Triglyceride Levels after Pharmaceutical Intervention: A GAW 20 Analysis**

Jenna Veenstra, Anya Kalsbeek, Karissa Koster – Faculty Sponsor: Nathan Tintle

In the search for an understanding of how genetic variation contributes to the heritability of common human disease, the potential role of epigenetic factors – such as methylation – is being explored with increased frequency. While standard analyses test for associations between methylation levels at individual CpG sites and phenotypes of interest, recently some investigators have tested for methylation, which may modulate the effects of genetic polymorphisms on phenotypes. In our analysis we used both a genome-wide and candidate gene approach to investigate potential SNP-CpG interaction on changes in triglyceride levels after treatment with fenofibrate.

**For Sale: Memories**

Lydia VanWingerden – Faculty Sponsor: Matt Drissell

As we move on to different chapters of our lives, we leave memories in the mundane and everyday objects. Floors are something we encounter each and every day, but hardly ever recognize their significance. Each stain, scratch, burn mark, and faded spot on my kitchen floor has significance. The significance does not lie in the stain, burn mark, scratch, or faded spot, but in the events and memories to which they are tied.
Gene-Based Tests of Genetic Association: Improving Power Using Multi-Marker Tests

Jordan Huisman, Jason Vander Woude, Lucas Vander Berg, Abbey Bos – Faculty Sponsor: Nathan Tintle

While methylation data has continued to rise in popularity, much is still unknown about how to best analyze methylation data in genome-wide analysis contexts. Given continued interest in gene-based tests for next-generation sequencing data, we evaluated the performance of novel gene-based test statistics on simulated data from Genetic Analysis Workshop 20. Our preliminary analysis suggests that while gene-based tests are detecting real signals and maintaining the type I error rate, their power is generally below that of single-marker test statistics. Future work is needed to explore why gene-based tests are performing less optimally and potentially design gene-based test statistics with better properties.

Genome-wide Interaction Study of Red-blood Cell Fatty Acids on Inflammatory Biomarkers in the Framingham Heart Study

Jenna Veenstra, Anya Kalsbeek – Faculty Sponsor: Nathan Tintle

Numerous genetic loci have been identified which associate with fatty acids levels and/or inflammatory biomarkers (e.g., interleukin, c-reactive protein, tumor necrosis factor, etc.). Recently, using red blood cell (RBC) fatty acid data from the Framingham Offspring Study, we conducted a genome-wide association study of over 2.5 million single nucleotide polymorphisms (SNPs) and 22 RBC FAs (and associated ratios) after adjusting for dietary covariates. Our analyses identified numerous causal loci. We now present the results of analyses which use a genome-wide approach to test for possible gene-FA interactions on a variety of inflammatory biomarkers to begin to evaluate the extent to which genetic variability modifies the relationship between circulating fatty acids and inflammatory biomarkers.

Identification of DNA Sequence Variants

Jessica Cheney, Caleb Herman, Jordan Peters, Rebecca Steiger – Faculty Sponsor: Tony Jelsma

Our Genetics class is participating in an ongoing study to identify gene variants that may be associated with cardiovascular disease. Anya Kalsbeek identified a collection of single nucleotide polymorphisms (SNPs) that correlated with altered levels of polyunsaturated fatty acids and which differ in their correlation between male and female. We identified genes near these SNPs and determined their functions. We also determined whether expression of these genes could be regulated by estrogen. We are examining these gene functions to determine their possible association of fatty acid regulation, inflammation, or cardiovascular disease.

Identification of DNA Sequence Variants Linked to Fatty Acids and Gender

Kasey VandenBosch, Katerina Meybaum, Leah Breon, Renee Ewald – Faculty Sponsor: Tony Jelsma

Advanced Genetics contribution to an ongoing study to identify the association of gene variants and cardiovascular disease. Anya Kalsbeek identified a collection of single nucleotide polymorphisms (SNPs) that correlated with altered levels of polyunsaturated fatty acids and differed in correlation between males and females. We identified genes near these SNPs and determined their functions. We also determined whether these genes could be regulated by estrogen. We are examining these gene functions to determine their possible associations with fatty acid regulation, inflammation, and cardiovascular disease.

Identification of DNA Sequence Variants Linked to Fatty Acids and Gender

Gala Campos, John Davelaar, Lydia Marcus, Nathan Spaans – Faculty Sponsor: Tony Jelsma

We are participating in an ongoing study to identify novel gene variants associated with cardiovascular disease. In her research, Anya Kalsbeek identified a collection of single nucleotide polymorphisms (SNPs) that correlated with altered levels of polyunsaturated fatty acids but differed in this correlation between males and females. We identified genes near these SNPs and determined whether expression of these genes could be regulated by estrogen. We are examining these gene functions to determine their possible association with fatty acid regulation, inflammation, or cardiovascular disease. In this way we are hoping to identify novel genes that may be associated with cardiovascular disease.
**Intergenerational Daycares – Good or Bad idea?**

**William Tjeerdsma** – Faculty Sponsor: Erin Olson

The premise behind my idea is that we (Americans) should strive to open up more intergenerational daycares, due to the benefits that can be reaped. In the presentation, I will propose and explain my idea, describe a few articles that have used this structure, and describe their findings. I would also describe some of the ethical concerns and limitations of this form of care. Nursing homes that have daycare had a lower rate of depression in the residents and the children developed at a faster rate and behaved better.

**Risk Factors for Mental Distress in Ukraine**

**Michaela Schotanus, Brendon Watchorn, Jason Goslinga** – Faculty Sponsor: Nathan Tintle

For our project, we completed statistical analysis of some of the potential risk factors for mental distress for residents in the Ukraine. We have researched to what degree mental distress is impacted by the following factors: sex, age, location, socioeconomic status, childhood conduct problems, parental violence, and agoraphobia. Data for this project was collected through the Ukraine World Mental Health survey in 2002 as 4,725 respondents ages 18 and older were interviewed with the Composite International Diagnostic Interview (World Mental Health version). Mental distress has been measured by the K6 distress scale which scores respondents on a scale between 0 and 24, with higher scores indicating a greater tendency towards mental distress. We hypothesized that the various explanatory variables would possess significant effects on the respondent’s K6 distress score and that several of the variables would participate in statistical interactions.

**Risk Factors for Co-morbid Smoking and Alcohol Abuse in Ukraine**

**Julia Bos, Sydney Faber, Lydia Marcus** – Faculty Sponsor: Nathan Tintle

We studied whether there is a relationship between mental health history and co-morbidity of smoking and alcohol dependence in Ukrainian people. In particular, we examined the effects of lifetime anxiety, lifetime depression, lifetime IED, and lifetime affective disorder. Previous research has indicated the combined use of nicotine and alcohol likely produces an addictive nature different from that produced by the use of one or the other by itself (Tarren & Bartlett, 2017). We analysed the data to determine the probability of codependance based on these risk factors.

**Rethinking Rhizome RNA**

**Nathan Ryder, Mark Huitsing** – Faculty Sponsor: Nathan Tintle

Johnson grass is a perennial variety of sorghum. In order to spread out and return each year, this plant uses rhizomes, which are horizontal underground stems growing from the roots and sending out lateral shoots that will form new plants. In summer 2015, Dordt College research students received harvested Johnson grass rhizomes from the Land Institute in Kansas. These students performed an RNA extraction on the material they received, and this RNA was sent to a collaborator for RNA sequencing and assembly. Now the assembly has been run through BLAST2GO and preliminary analysis is being performed, hoping to draw exciting new phenotypic mappings from this cutting edge data.

**Study of Growth Patterns of Flowering Mutants of Pennycress (Thlaspi arvense)**

**Katie Eshelman, Imanuel Feodor, Elijah Rick, Ross Schreur** – Faculty Sponsor: Tony Jelsma

We are investigating developing Pennycress (Thlaspi arvense) as a possible cover crop to reduce soil erosion. In this project Dr. Kevin Dorn at the University of Minnesota isolated a number of Pennycress mutants that had an earlier flowering time. These mutants all have a mutation in the FLC flowering locus gene, but the effects of the different mutations have not been further investigated. We examined these mutants for their growth characteristics, including plant height, width, days before flowering, and numbers of seed pods. This data will help us understand the role of the FLC gene in regulating plant development, and may help us identify lines that may be more suitable for cover crops.
Study of Growth Patterns of Flowering Mutants of Pennycress
Victoria Cast, Johanna Lubke, Chris O'Connor, Richard Walvoort – Faculty Sponsor: Tony Jelsma
Pennycress (Thalaspi arvense) is being investigated as a possible cover crop to reduce soil erosion. Dr. Kevin Dorn at the University of Minnesota isolated a number of Pennycress mutants that have an earlier flowering time. These mutants all have a mutation in the FLC flowering locus gene, but the effects of the different mutations need to be investigated further. We examined growth characteristics of these mutants including plant height, width, flowering dates and the number of seed pods. This data will help us understand the role of the FLC gene in regulating plant development, and may help us identify lines that may be more suitable for cover crops.

Teaching Foreign Language with Gestures and Sign Language
Jessica Walvoort – Faculty Sponsors: Rikki Heldt, Kathleen VanTol
Using sign-language and gestures in a foreign classroom setting enhances student's memory and learning. The gestures are paired with words and phrases so students can use both their body and mind to commit the new language to memory. This method is fun for students and teachers and keeps the class time engaging. Through research, I have found evidence of students advancing in foreign language classrooms in reaction to this teaching method.

Two Unique Ways to Freeze a Moment in Time
Kaitlyn Frye – Faculty Sponsor: Doug Burg
The photograph has changed and developed over many years – from using film to using the digital version. The project is to first show the difference in techniques and styles between film and digital photography. Digital photography is also easier to manipulate and spread false ideas of then subject of the photo, than in film photography, even though it can be done in film. Christians need to be cautious when looking at a photo whether it be film or digital, to be aware of the manipulation and what is truth in these photos.