

# POLYX

## FYE SHOWCASE

# FALL 2025

Tuesday, December 2, 2025

11:30 AM - 1 PM

Ursa Major • Bronco Student Center



# TABLE OF CONTENTS

---

**Event Schedule / Showcase Remarks ..... 1**

**Planning Committee ..... 2**

**PolyX FYE Projects ..... 3 - 36**

Don B. Huntley College of Agriculture ..... 3

College of Business Administration ..... 14

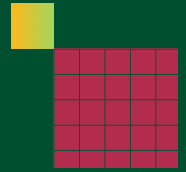
College of Engineering ..... 26

College of Science ..... 32

**Acknowledgement ..... 37**



# EVENT SCHEDULE



**Tuesday, December 2, 2025 - 11:30 AM to 1:00 PM**

**9:30 AM - 11:30 AM**

**Check-In**

**11:30 AM - 11:45 AM**

**Showcase Remarks**

**11:45 AM - 12:45 PM**

**Student Presentations**

**12:45 PM - 1:00 PM**

**Closing Remarks**

## SHOWCASE SPEAKERS



**Dr. Terri Gomez**

Provost and Vice President,  
Academic Affairs



**Ericka Olguin**

Director,  
Innovation Incubator



**Dr. Dora Lee**

Assistant Vice President,  
Academic Engagement  
and Success

# PLANNING COMMITTEE

---



**Ericka Olguin**

Director,  
Innovation Incubator



**Dr. Dora Lee**

Assistant Vice President,  
Academic Engagement and  
Success



**Dr. Preeti Wadhwa**

Professor,  
College of Business  
Administration



**Christian Rivera**

Assistant,  
Academic Support and  
Learning Services



**Caitlyn Kubulan**

Communications Specialist,  
Office of Academic  
Innovation



**Josue Ruiz**

Tech and Admin Analyst,  
Office of Academic  
Innovation



**Michelle Perez**

Student Assistant,  
Innovation Incubator



**Debbie Tanaka**

Program Coordinator,  
Innovation Incubator



**Matthew Walsh**

Associate Director,  
Alumni Association



# POLYX FYE PROJECTS

---

## Don B. Huntley College of Agriculture

### How Social Media Influences the Diets and Perspectives of Adolescents with Eating Disorders

**Team Members:** Melissa Viveros, Adriana Veloz, Wendy Casarez, Dafne Torres, Jose A. Valenzuela, and Jamie Yang

**Course Name:** NTR 1000

**Mentor:** Dr. Fatheema Begum Subhan

**Project Summary:** Due to the increasing use and prevalence of social media within the lives of most members within society, it raises the question whether the content that is consumed on the daily is beneficial- both mentally and physically, for individuals that struggle with their mental health and stability; are they able to obtain adequate nutrition for themselves on the daily with what they consume digitally? Through further investigation, it can be analyzed and understood that the presence of unhealthy and unbalanced diets, routines, and habits that are promoted online may be the catalyst for the community's struggle with disordered eating.

### Hispanic Dietary Patterns: Tradition, Health, and Nutrition

**Team Members:** Nathan Rojas, Juliette Paz, Diego Pantoja, Ethan Ramirez, and Caroline Ponce

**Mentor:** Dr. Fatheema Begum Subhan

**Course Name:** NTR 2180

**Project Summary:** A study that is focused on the health and nutrition of the Latin American community. This study dives into the food security, dietary practices, and contemporary changes in the diets of Latin Americans. Our research also analyzes the many health problems that are attributed to the diets of Latin Americans.

### Asian Stomach's in America: Food, Identity, and Assimilation

**Team Members:** Alejandra Vargas, Haozhen Xu, Matthew Zalavarria, Nathan Wong, and Ryan Yi

**Mentor:** Dr. Fatheema Begum Subhan

**Course Name:** NTR 2180

**Project Summary:** Asian Stomachs in America: Food, Identity, and Assimilation, explores how cuisine shape's Asian American identity and belonging. Through food, immigrants preserve culture while navigating pressures to assimilate. This paper examines the symbolic role of eating, cooking, and sharing meals as acts of resistance, adaptation, and self-expression within American Society.



## How Advertising Influences Children's Health in California

**Team Members:** Naomi Zia, Selena Bechtel, Adelyne Yee, Avalon Hosaka, and Scarlet Ramirez

**Course Name:** NTR 1000

**Mentor:** Dr. Fatheema Begum Subhan

**Project Summary:** Media and advertisement exposure among California children jeopardizes the creation of health outcomes such as obesity, poor eating habits, and body image issues. More than unexposed kids, children exposed more frequently suffer from endorsement of detrimental food items and unrealistic standards negatively on long-term physical and mental wellbeing.

## Racial, Social, and Economic Disparities Among Latin Americans in the U.S.: Impacts on Culture, Food Systems, and Health

**Team Members:** Amaya Alvarez, Kevin Arruti-Sanchez, Bui Nguyen, Lyzette Aldana

**Mentor:** Dr. Fatheema Begum Subhan

**Course Name:** NTR 2180S

**Project Summary:** This research project explores the racial, social, and economic disadvantages experienced by Latin Americans in the United States. It examines how injustices influence cultural customs, food systems, and health outcomes. The research also discusses current attempts to close racial gaps, revive traditional practices, and promote fair access to food and health care.

## Food Disparities and Habit of Asian American People

**Team Members:** Noah Tran, Kassandra Terce, Heather Trombley, and James Yuon

**Mentor:** Dr. Fatheema Begum Subhan

**Course Name:** NTR 2180S

**Project Summary:** We conducted a study about the food habits of Asian Americans concerning their cultural and socioeconomic conditions. From research and in-person interviews, we were able to compile an in depth study between Asian Americans and their diet.

## Reducing Food Waste and Promoting Upcycling at Centerpointe Dining Hall

**Team Members:** Hayden Jenson, Emmett Reibel, Megan Rodriguez, Mathieu Salunson, and Evan Nhan

**Mentor:** Dr. Fatheema Begum Subhan

**Course Name:** NTR 2180S

**Project Summary:** Centerpointe is the premier dining hall at Cal Poly Pomona. The all-you-can eat style of dining leads to large amounts of food waste from students. Centerpointe staff are doing their part to implement up-cycling habits including transforming food into fertilizer and animal feed, but they need our help.



### **Poly Pantry: Nourishing Broncos One Meal At a Time**

**Team Members:** Edgar Villa, Jake Hoang, Isaac Read, Logan Elijah Khusit, Rusal Fairouz, and Marianne Salazar

**Course Name:** NTR 2180S

**Mentor:** Dr. Fatheema Begum Subhan

**Project Summary:** Our posters will be focusing on information on how to use and familiarize students with Poly Pantry, and give students healthy recipes using Poly Pantry ingredients.

### **Care Center Food Insecurity**

**Team Members:** Justin Chea, Ashton Andrews, Alec Abich, Devon Santana, Maritza Cervantes, and Jaden Miel Queron

**Mentor:** Dr. Fatheema Begum Subhan

**Course Name:** NTR 2180S

**Project Summary:** Food insecurity is a continuing issue on the CPP campus. Despite this, many students are not familiar with what and where resources are available, thus causing them to settle for low-quality foods or even resorting to skipping meals entirely. Our findings assess how students are affected by food insecurity, as well as providing resources to address these issues.

### **Integration of Commuting Student Base via Social Events**

**Team Members:** Chloe Chung, Anthony Grantham, John Corbin, Maria Cruz, Marilyn Florencio, Melissa Pliego, and Evelyn Naing

**Mentor:** Dr. Fatheema Begum Subhan

**Course Name:** NTR 2180S

**Project Summary:** It's been noticed that community-building events cater less towards the commuter base of CPP, instead prioritizing students dorming on-campus. Our proposal allows us to cater towards the commuter populace, helping them connect and bond with their fellow peers.

### **Raising Awareness About the Impact of Excessive Social Media Use and Screen Time on Mental Health**

**Team Members:** Faith Olumofin, Geovani Lopez, Kobe Oliva, Aaron Llamas, Jake Mu, and Bryan Luna-Atlatenco

**Mentor:** Dr. Fatheema Begum Subhan

**Course Name:** NTR 2180S

**Project Summary:** Among college students, the rise in the accessibility and the reliance on cell phones had led to excessive social media and screentime usage. This usage has been linked to anxiety, loneliness and low self esteem. Developing actionable solutions to reduce this usage can help negate the effects on mental health.

## FRESH

**Team Members:** Kyle Lam, Sebastien Khvang, Andrew Ventura, Elliot Kwon, Aubrey Young, and Jessica He

**Course Name:** NTR 2180

**Mentor:** Dr. Fatheema Begum Subhan

**Project Summary:** Nicotine is an addictive drug that can negatively impact your physical health, mental health, and relationships. Nicotine isn't the answer to all your problems; instead let's choose to be better. Choose FRESH and make tomorrow brighter.

## Latin American communities facing cultural, traditional, and stability difficulties in the U.S.

**Team Members:** Yesenia Diaz Delgado, Naveen Dsa, Matthew A. Gomez, Eliza R. Cameron, and Jimena Flores

**Mentor:** Dr. Fatheema Begum Subhan

**Course Name:** NTR 2180

**Project Summary:** Latin American immigration in the U.S. is driven by government corruption and instability. It highlights how Latino families preserve and adapt their cultural and religious traditions for their environment, while also contributing to U.S. diversity despite facing racism. It's revealed that many Latinos' identity, community, faith, and family practices are greatly affected.

## Exploring the Food Security and Dietary practices of Latin Americans

**Team Members:** Maya Hodges, Mason Huang, Emmanuel Hernandez Aguilar, Annaka Griffin, Geraldine Gonzalez, and Angel Tellez

**Mentor:** Dr. Fatheema Begum Subhan

**Course Name:** NTR 2180

**Project Summary:** Food security among Latin Americans in the U.S. is shaped by economic and racial disparities, leading to reliance on processed foods and health risks. Cultural traditions remain vital, but access to affordable, healthy, and culturally appropriate foods is a key challenge impacting diets and overall well-being.

## What is the Role of Micronutrient Deficiencies and Hypertension in Children of Low Income Families?

**Team Members:** Anthony Hattouni, Diego Granados, Steven Castillo, Annalisa Faundez, Natalie Garcia, and Luis Garcia

**Mentor:** Dr. Fatheema Begum Subhan

**Course Name:** NTR 1000

**Project Summary:** Micronutrient deficiencies, especially in the younger population, have scientific research verifying a link between those deficiencies and hypertension. When children from low-income households do not have a proper diet due to income-related restrictions, a lack of nutrient dense foods may negatively impact a child's health.



## Understanding the Intersection of Culture, Food, and Disparities in the Latino Community

**Team Members:** Cesar Gomez, Michael Flores, Lia Gerigorian, Angie Contreras, and Kevin Flores

**Mentor:** Dr. Fatheema Begum Subhan

**Course Name:** NTR 2180

**Project Summary:** This project examines how Latino college students experience food insecurity and cultural displacement. Through literature review and interviews, we identified barriers to accessing traditional foods, financial strain, and health risks linked to disrupted diets.

## Culture and Food Choices Among College Students

**Team Members:** Jesus Cabrera and Santiago Basaldua

**Mentor:** Dr. Fatheema Begum Subhan

**Course Name:** NTR 2180

**Project Summary:** This study explores how culture, finances, and time shape college students food choices. Interviewing with Jamaican-American and Mexican-American students and a review of articles that show how cultural identity influences values, cost and convenience in there daily eating habits.

## Understanding the Intersection of Culture, Food, and Disparities in Latin Communities

**Team Members:** Sauda Khan, Paul Grey, Victoria Guerrero, Mohammed Hossane, and Narek Isayan

**Mentor:** Dr. Fatheema Begum Subhan

**Course Name:** NTR 2180

**Project Summary:** Latin Americans are one of the fastest growing groups in the United States and overtime poverty, language barriers, and policies, make it harder for them as they continue to grow. Along with their educational accomplishments, they still face income disparities and 18% of the population live below the poverty line. Nearly 22% of the Latin community experience hunger. So, Latinos in lower income areas have limited access to supermarkets, and those in rural communities have a harder time with transportation to markets. This leaves them food insecure, without their healthy diet which includes whole grain, corn, tortillas, beans, and vegetables.



### Examining the Effects of Breast Cancer as a Community Health Issue

**Team Members:** Jessica Ordunez, Brandon Chang, Edward Dominguez, and Breeana Cruz

**Course Name:** NTR 1000

**Mentor:** Dr. Fatheema Begum Subhan

**Project Summary:** Breast cancer is one of the most crucial community health issues because it is one of the most common cancers among women. Our group is focusing on the connections between prevention and treatment. In our poster we discuss on topics and relevant information including the risks, how race plays a role, lifestyles, and lastly how genetics plays a role.

### Food Security Challenges and Food Culture Within Hispanic American Communities

**Team Members:** Lucciana Camerota, Mariam Elsalanty, Narek Elaryan, Andrew Flores, and Secilia Escobar-Day

**Mentor:** Dr. Fatheema Begum Subhan

**Course Name:** NTR 2180

**Project Summary:** Food security and dietary practices within the U.S. Hispanic community are shaped by socioeconomic factors, cultural traditions, and acculturation. Limited affordability and reliance on processed foods heightened health disparities. Our research examines these characteristics among Hispanic students at Cal Poly Pomona to better understand their food access and nutritional habits.

### Examining Food Security and Dietary Practices in Latin American Communities in the U.S.

**Team Members:** Rajat Tak, Arturo Rodriguez, Jose Ramirez, Johan S. Rodriguez, and Jackson Tatalovich

**Mentor:** Dr. Fatheema Begum Subhan

**Course Name:** NTR 2180

**Project Summary:** This research investigates the correlation between food security and dietary habits among Latin Americans in the United States. Latin Americans, as a multicultural and expanding demographic, encounter increased food insecurity and shifting dietary patterns due to acculturation, in addition to cultural heritage and socioeconomic obstacles.

### Food Insecurity in the AAPI Community

**Team Members:** Victor Lee, Hyoeun Lee, Alexander T. King, Zahir Muhammad, and Gloria Kim

**Mentor:** Dr. Fatheema Begum Subhan

**Course Name:** NTR 2180

**Project Summary:** Our research explores food insecurity in the AAPI community, showing how culture, cost, and stereotypes affect access to food. Personal stories and data reveal challenges in keeping cultural food traditions while facing financial and social barriers that are often overlooked in general food security reports.



## Resilience Through: Exploring Cultural and Nutritional Adaptation of Asian Americans

**Team Members:** Brian Melendez, Fernando Majin, Orion Nadziejko, and Michelle Lopez

**Course Name:** NTR 2180

**Mentor:** Dr. Fatheema Begum Subhan

**Project Summary:** This study examines cultural resilience and nutritional adaptation among Asian Americans, with emphasis on Vietnamese communities. Interviews and research reveal how traditional foodways persist despite barriers like language, discrimination, and limited access. Findings highlight the need for inclusive food assistance and culturally sensitive support to promote health equity and preserve heritage.

## Latin American Communities in the U.S: Food, Culture, and Disparities

**Team Members:** Ana Alvarez, Alexander Adalat, Soroush Azizi, and Rayyan Hishman

**Mentor:** Dr. Fatheema Begum Subhan

**Course Name:** NTR 1000

**Project Summary:** Latin Americans and their culture have a significant presence in the United States, accounting for about 20% of the population. As the Latin community continues to grow, it's important to understand their traditions, lifestyles, and the challenges they face. Food insecurity is a huge challenge for Latin Americans due to economic struggles, limited access to grocery stores, and racial inequalities. All those factors make it difficult to find fresh, healthy, and culturally familiar foods. These factors, in addition to diet changes, from traditional nutrient-rich foods to more processed and fast foods, have contributed to more health issues such as obesity and diabetes. In general, the research shows the need to address these health disparities while acknowledging and supporting Latin Americans' cultural traditions.

### **Examining the Effects of High Animal Protein Intake in Adults 18 and Over**

**Team Members:** Brooke Roth, Elizabeth Soliz, Ashley Torres, Isis Rivas, Chelsea Olivares, and Katelyn Roncal

**Mentor:** Dr. Fatheema Begum Subhan

**Course Name:** NTR 1000

**Project Summary:** This presentation examines the long-term liver effects of excessive animal protein consumption in American adults. It provides scientific evidence, discusses current solutions, and addresses health concerns linked to media-promoted fad diets. The goal is to raise awareness about maintaining a balanced diet and making informed protein intake choices.

### **Examining How Polycystic Ovary Syndrome (PCOS) Affects Women**

**Team Members:** Alana Lee, Lainey Cortright, Claire Kerian, Ovionna Hayes and Karah Marchetti

**Mentor:** Dr. Fatheema Begum Subhan

**Course Name:** NTR 1000

**Project Summary:** Polycystic Ovary Syndrome (PCOS) is one of the most common hormonal disorders affecting individuals with ovaries, particularly those of reproductive age. Our research examines how nutrition professionals can play a vital role in managing and preventing PCOS through evidence-based dietary interventions.

### **Food Security and Dietary Practices of the Chumash Tribe in America and Food Security within the Minorities at Cal poly Pomona**

**Team Members:** Sreesha Siruvuru, Jack Schwartz, Bethany Rivas, and Brandon Shipman

**Mentor:** Dr. Fatheema Begum Subhan

**Course Name:** NTR 2180

**Project Summary:** In this report, we will be overviews the Chumash tribe. This tribe was located originally along the central and southern California coast, from roughly San Luis Obispo to Malibu. The Chumash members were forcibly removed off their land by the United States government and they lost their connection to their culture and native food. This also affected many of the tribe members' health.

### **Adult Obesity and Related Chronic Diseases**

**Team Members:** Phillip Mwathi, Elsa Morataya, Lyzette Aldana, Melanie Castilleja, and Renesa Bailey

**Mentor:** Dr. Fatheema Begum Subhan

**Course Name:** NTR 1000

**Project Summary:** Adult obesity affects around 40% of U.S. adults and is linked to chronic diseases such as heart disease, type 2 diabetes, and more. The study taken takes into account literature on obesity and its causes. We put focus on prevention by having nutrition education, physical activity, and more.



### Comprehending the Intersection of Culture and Food Disparities of African America

**Team Members:** Shemi Brown-Dawson, Nikko Billew, and Joel Burrows

**Mentor:** Dr. Fatheema Begum Subhan

**Course Name:** NTR 2180

**Project Summary:** The food insecurities that have been faced by African American communities throughout the US is a great amount in comparison to other communities in the nation. There are steps being taken to combat the issue however, there is more that can be done. My studies identify the percentages of Black people that are struggling, real life examples of people experiencing these insecurities, and whether or not the solutions are working.

### Issue of Student Aversion Towards Campus Water Fountains

**Team Members:** Sandy Chui, Felix Conchas, and Ian Muir

**Mentor:** Dr. Xu Yang

**Course Name:** FST 1000

**Project Summary:** We have noticed that although there is access to water fountains with water filters throughout the school, students still tend to go for bottled water, water dispenser, or flavored drinks. We feel that this is due to not only sensory factors, but also cleanliness involving the water access at school.

### Socioeconomic Barriers to Health in Latin American Populations

**Team Members:** Jintaya Lopez, Jaden Joe, Josh Lee, Lincoln Hulme, and Julian Iwamoto

**Mentor:** Dr. Fatheema Begum Subhan

**Course Name:** NTR 1000

**Project Summary:** Latin Americans are an integral part of United States. But they face challenges with food security. Around one fifth of all hispanic households experience food insecurity, and one of every 10 live in inadequate housing. Throughout this, they play a distinct role in shaping the U.S while affirming their distinct and beautiful cultural identity.

### The Impact of Visual Imperfections on Food Waste

**Team Members:** Aiden Rai Aya-Arsenio, Nayeli Jimenez, Tara Mitchell, and Maya Palomar

**Mentor:** Dr. Xu Yang

**Course Name:** FST 1000

**Project Summary:** Discarding foods such as fruits and vegetables due to visual imperfections is a global, widespread practice. Even though these foods are perfectly edible and have the same quality, nutritional value, and taste as visually perfect foods. They are often rejected by suppliers, retailers, and consumers, leading to an unnecessary food waste problem. In this poster we provide solutions to this worldwide problem.

### **Scraps Please!**

**Team Members:** Matias De La Garza, Eva Orellana, Lily Rowley, and John Nguyen

**Mentor:** Dr. Xu Yang

**Course Name:** FST 1000

**Project Summary:** Food waste is a growing problem that wastes resources and adds to pollution. This project explores how reducing, reusing, and composting food scraps can cut waste and build a more sustainable food system. Food scraps aren't garbage, they're a resource we can use to reduce this problem.

### **The Fermentations of Foods**

**Team Members:** Mariana Vargas, Teagan Suclla, Janette Perez, and Nelson Artiga

**Mentor:** Dr. Gabriel Davidov-Pardo

**Course Name:** FST 1000

**Project Summary:** Many of the foods we consume today are fermented, like pickles and yogurt. Fermented foods have many benefits that help our body's digestive system and help keep us healthy. We will explain and visually demonstrate how fermentation works in food.

### **COMMUNITY ELECTRIC SCOOTERS**

**Team Members:** Yasmein Abu Sarriyeh, Jun S. Ki, Katherine Rodriguez, and Jacqueline Flores

**Mentor:** Dr. Xu Yang

**Course Name:** FST 1250

**Project Summary:** Students have daily struggles navigating CPP campus due to buildings especially that have an incline to the top and bottom of the hill. Along with, mainly of the campus resources are located being in the bottom of the hill. Students constantly often finding it difficult to move efficiently from one place to another and commuting can be exhausting for the students. Although, Bronco Express shuttle is available, it often can fail to provide timely service. This ongoing issue negatively impacts students overall well being and productivity. By introducing electric scooter offer a fast, affordable, and sustainable solution to this challenge we are currently facing. This would dramatically reduce travel time and increase the chance of student job opportunities. Implementing an e-scooter program would reflect CPP commitment as an innovation, sustainability and student success.



### The Science Behind Glow in the Dark Food Products

**Team Members:** Karen Sanchez Morales, Emily Huynh, Kaitlin Cayabyab, and Dallas Hightower

**Mentor:** Dr. Gabriel Davidov-Pardo

**Course Name:** FST 1000

**Project Summary:** Exploring florescence in everyday food products. Focusing on ingredients such as riboflavin/ vitamin B2 (in energy drinks), Turmeric extract in Sour patch kids Glow in the Dark and Quinine in Tonic water.

### The Science of Sensory: The Difference Between Similar Products

**Team Members:** Jakob Bathon, James Hick, Natalie Tok, Chloe Lee, and Alonzo Araujo

**Mentor:** Dr. Gabriel Davidov-Pardo

**Course Name:** FST 1000

**Project Summary:** Sensory Science allows researchers to experiment on foods. Our research utilizes a triangle test to understand how consumers perceive differences in similar products when given them blindly, which is a heavily used technique in Food Science.

### The Effects of Various Fats within Cookie Production

**Team Members:** Samantha Macias, Kaylin Rodriguez, Alexis Bjork, and Will Ronnau

**Mentor:** Dr. Gabriel Davidov-Pardo

**Course Name:** FST 1000

**Project Summary:** The functionality of ingredients is heavily considered when formulating any product. In this case we focused on how various fats affect the texture and taste of a cookie.

### How Do You Like Them Apples?

**Team Members:** Melissa Ruddy and Adrienne Morrow

**Mentor:** Dr. Gabriel Davidov-Pardo

**Course Name:** FST 1000

**Project Summary:** We will be testing the enzymatic oxidation of apples, using different pH levels, some being acidic, or basic, while comparing to a control. Enzymatic oxidation is often considered bad, because of the change in appearance, texture, and taste of the product. Our experiment will show different ways to prevent this.



# POLYX FYE PROJECTS

---

## College of Business Administration

### Hydrating Hope: The Johannesburg Mission

**Team Members:** Rocio Medina Garcia, Ryan Tran, Lexis Jacobo, and Luke D'Elia

**Mentor:** Dr. Jacquelyn Trejo Torres

**Course Name:** BUS 1010

**Project Summary:** Our mission is to ensure water equality in Johannesburg, Africa by focusing on water conservation and distribution efforts by improving upon the current infrastructure and by addressing government corruption that has led the city to fall into its current water crisis.

### Sustain-A-Meal

**Team Members:** Dylan Carlos, Austin Chen, Kaylin Ruiz, and Adam Zarate

**Mentor:** Dr. Jacquelyn Trejo Torres

**Course Name:** BUS 1010

**Project Summary:** California farms face ongoing challenges with food waste and unstable production, contributing to nearly six million tons of discarded organic waste each year. To address this, adopting sustainable farming practices like crop rotation, regenerative agriculture, and water-efficient irrigation can reduce waste, enhance soil health, and build more resilient local food systems.

### From Frozen to Fragile: A decade of Antarctic change

**Team Members:** Hannah Siliezar, Ashely Magallon, Wade Pan, and Ricky Li

**Mentor:** Dr. Jacquelyn Trejo Torres

**Course Name:** BUS 1010

**Project Summary:** From 2010 to now, Antarctica experienced rising temperatures and rapid glacier retreats. Using both climate and satellite data this study highlights mass ice loss, temperature anomalies, and sea level implications. Showing Antarctica's increasing vulnerability to warming, emphasizing the importance of monitoring change for future climate predictions.

### Integrating Japanese Urban Planning Lessons to Address Homelessness in Nepal

**Team Members:** Jeffrey Guardado, Emelyn Alvarado, Jayden Huang, and Kenji Fukuda

**Mentor:** Dr. Jacquelyn Trejo Torres

**Course Name:** BUS 1010

**Project Summary:** Nepal's current government has experienced numerous challenges, which have led to an increase in misplaced citizens. The rise in vagrancy hinders the overall development of the country. By building upon ideas of how Japan's government implements their sustainable way of life, we can redefine the challenges of homelessness facing Nepal in building sustainable and inclusive cities.



### Waves of Waste

**Team Members:** Kaitlin Trinh, Alicia Soto, Nadia Padilla Rincon, and Alexander Loera

**Mentor:** Dr. Jacquelyn Trejo Torres

**Course Name:** BUS 1010

**Project Summary:** Sea animals that coexist within the North Pacific Ocean are constantly being harmed and possibly endangered by the North Pacific Garbage Patch. With our research of this current ongoing problem, we will examine how events such as entanglements and exposure to toxic materials are slowly causing fatal harm to these sea creatures.

### Humanizing Immigration Detention While Upholding Legal Rights

**Team Members:** Steven Gonzalez, Raul Sanchez-Ramirez, Vivian Hernandez, and Edward Jauregui

**Mentor:** Dr. Jacquelyn Trejo Torres

**Course Name:** BUS 1010

**Project Summary:** Recent immigration processes have faced many challenges regarding immigration centers. This has affected their families and lives here in the U.S. Our project focuses on how these detention centers can be made more humane and helpful rather than hurtful. Together we can collaborate with other groups and organizations to provide and shed light on these issues.

### Bacteria Might be the Future of Science

**Team Members:** Sherra Li, Kevin Santos, Carla Policarpo, and Julian Rivas

**Mentor:** Dr. Jacquelyn Trejo Torres

**Course Name:** BUS 1010

**Project Summary:** Hundreds of millions of plastic waste contributes greatly to today's ocean pollution. Despite preventive measures such as recycling and efforts to prohibit littering, there are little proactive measures in the actual ocean that help solve this pressing problem. In our research, we dive deeper on the research of *Ideonella sakaiensis*.

### Clean Water, Bright Futures: Protecting People's Health in Central Africa

**Team Members:** Jenna Aguayo, Eli Ibarra, Lawrence Quach, and Ethan Lopez

**Mentor:** Dr. Jacquelyn Trejo Torres

**Course Name:** BUS 1010

**Project Summary:** Central Africa faces an increasing water and sanitation crisis driven by conflict, poverty, and climate change, leading to disease and high child mortality. Millions lack access, fueling health crises and poverty cycles, underscoring the urgent need for infrastructure and governance to secure clean water and hygiene and basic human rights.



### **A Brighter Tomorrow: Clean Energy Opportunities for Hong Kong**

**Team Members:** Travis Prough, Gabriel Vasquez, Jacob Ramos, Hector Cervantes

**Mentor:** Dr. Jacquelyn Trejo Torres

**Course Name:** BUS 1010

**Project Summary:** Access to sustainable energy is crucial, as reliance on fossil fuels severely harms the planet. Burning coal and other non-renewables emits greenhouse gases, depletes the ozone layer, creates harmful smog in populated areas, and drives global climate change, threatening human health and environmental stability worldwide.

### **The Structural Roots and Global Consequences of Gender Inequality**

**Team Members:** Kira Hashimoto, Kala Duan, and Cindy Deng

**Mentor:** Ava-Kathryn Capossela

**Course Name:** BUS 1010

**Project Summary:** Gender inequality, rooted in deep-seated cultural norms and structural factors, limits the world's potential. It manifests itself in wage gaps, lack of representation, and the burden of unpaid work, affecting families and economic growth. Addressing this deep-seated problem requires legal reform, education, and strengthening women's leadership.

### **SDG 7 Clean and Affordable Energy**

**Team Members:** Takuma Kawamura, Lazar Johnson, Jehu Cristobal, and Cristian Amador

**Mentor:** Ava-Kathryn Capossela

**Course Name:** BUS 1010

**Project Summary:** Development of clean and affordable energy has been still delay, and these issues stem from various factors. Our investigation prove that investment of clean and affordable energy is helpful in some areas.

### **Combating Hunger in Afghanistan Through Community Development and Agricultural Solutions Amid Political Instability**

**Team Members:** Saket Akalamkam, Valentin Liochev, Jaylen Diao, and Cameron Cun

**Mentor:** Dr. Jacquelyn Trejo Torres

**Course Name:** BUS 1010

**Project Summary:** Over the years, hunger has become a rising problem in Afghanistan due to issues like climate change, food insecurity, political instabilities, etc. Despite the challenges that plague Afghanistan's living, efforts to combat the growing hunger problem in Afghanistan have been ongoing for years. This research will go over some of the many actions being done to combat the hunger crisis in Afghanistan, as well as how these problems arise.



### Overcoming Healthcare Barriers for Low-Income Women in Los Angeles County

**Team Members:** Kayla Enclona, Alexandra Bonilla, Ryanne Riate, and Mira Tsai

**Mentor:** Ava-Kathryn Capossela

**Course Name:** BUS 1010

**Project Summary:** Low-income women in Los Angeles County face major barriers to healthcare, including high costs, limited providers, language barriers, and systemic racism. These challenges perpetuate poverty and poor health. Promoting equitable access to quality healthcare is essential to improve well-being and break the cycle of inequality.

### Protecting the Catalina Kelp Forest

**Team Members:** Hilton Vo, Smera Senthil, Huy Nguyen, and Sasha Emery

**Mentor:** Marcus Dorian Corra

**Course Name:** BUS 1010

**Project Summary:** The Catalina Kelp Forest was struggling for an extended period of time, and just recently preservation efforts have been made to save it. Our research examines what kelp does to help our planet and why it is important to continue these efforts.

### Waste-to-Watts

**Team Members:** Spencer Tien, Matthew Ngo, Eker Herrera-Nunez, and Rowan Trevino

**Mentor:** Ava-Kathryn Capossela

**Course Name:** BUS 1010

**Project Summary:** Wealthier areas can afford innovative upgrades, but low-income regions remain locked into inefficient, high-cost operations. This project aims to close that gap by exploring how net-zero wastewater recycling can be scaled to rural and disadvantaged communities, ensuring that water resilience and infrastructure innovation extend beyond large cities.

### The Effects of Healthcare Costs and Hospital Bills, and Various Means to Reduce It

**Team Members:** Matthew Ballinger, Andrew Nelly, and Matthew Galassi

**Mentor:** Marcus Dorian Corra

**Course Name:** BUS 1010

**Project Summary:** All across LA county and the United states, growing healthcare costs are leading to the insurmountable feeling of being unable to afford Good health. In our article, we analyze how various counties and countries reduce their costs for healthcare, and some of the personal strategies that can effectively reduce costs without reducing quality.



### Grounded Power

**Team Members:** Aliyah Caldera, Jonathan Roth, Kumayl Ayub, and Jordan Barba

**Mentor:** Marcus Dorian Corra

**Course Name:** BUS 1010

**Project Summary:** Our presentation is about exploring geothermal energy in the Los Angeles area, focusing on its potential for affordable and efficient clean power. We'll discuss general strategies for implementation, community benefits, and how geothermal systems could support sustainable energy goals while reducing costs and improving long-term environmental and economic resilience.

### Transitioning to Solar Energy in the U.S. and How It Shapes Costs and Emissions

**Team Members:** Khalil Watson, Pau Muta, and Brayden Romero

**Mentor:** Marcus Dorian Corra

**Course Name:** BUS 1010

**Project Summary:** Transitioning to solar energy in the United States offers major benefits for households and the environment. This research examines how solar adoption influences household energy costs, electricity production, and CO<sub>2</sub> emissions. By analyzing national data and renewable energy trends, the study highlights solar power's role in building a more sustainable and affordable future.

### Integrating Solar into California

**Team Members:** Yenhan Rodriguez, Joshua Champlin, Kyle Aram Chilingirian, Sven Dennert, and Derek Minh Le

**Mentor:** Marcus Dorian Corra

**Course Name:** BUS 1010

**Project Summary:** Solar energy is a clean renewable energy source. Integrating solar into California is not as simple as just putting solar panels on your home; it affects much more than your personal electricity bill. Our research tackles how financial and technological issues can be solved to adopt a cleaner California.

### Poverty in the Inland Empire

**Team Members:** Laura Gutierrez, Riley Johnson, Lilly Allen, and Hector Romero

**Mentor:** Marcus Dorian Corra

**Course Name:** BUS 1010

**Project Summary:** Homelessness has become a major issue in the Inland Empire, with many individuals lacking access to basic necessities such as food, water, and shelter. Limited resources, including overcrowded shelters and inconsistent food donations, make it difficult for people experiencing homelessness to find stability. Our research examines how increasing access to essential services and raising community awareness can help reduce homelessness and improve the well-being of those affected.



### Justice in Our Institutions

**Team Members:** Sabrina Ayala, Leonardo Gutierrez Rosas, Nolan Varney, Diego Guerrero, and Caleb Toney

**Mentor:** Ava-Kathryn Capossela

**Course Name:** BUS 1010

**Project Summary:** Peace, Justice, and strong institutions face major challenges worldwide. Persistent conflict and violence displace millions, while weak and corrupt institutions undermine trust and fair decision-making. Many people lack access to justice institutions, allowing human rights violations to continue in corruption that diverts resources away from essential services like healthcare and education. Without peace, justice, and strong institutions, achieving other SDGs becomes nearly impossible, making global efforts to strengthen institutions in order to combat corruption and promote inclusivity essential.

### Don't Buy That... It's Toxic!

**Team Members:** Audrey Siples, Althea Beltran, and Alonso Mendoza

**Mentor:** Ava-Kathryn Capossela

**Course Name:** BUS 1010

**Project Summary:** Ultra-Fast fashion is convenient and cheap, no wonder it's so popular! Unfortunately, these clothing items come with a catch, as there could be undisclosed chemicals and additives lurking in the materials. We have researched these additives as well as possible ways to make this knowledge more easily accessible for consumers.

### Poverty in Santa Barbara County

**Team Members:** Omar Robles, Oscar Venegas, Analee Gomez, and Valery Morales

**Mentor:** Dr. Jeanne Almaraz

**Course Name:** BUS 1010

**Project Summary:** Given the economic conditions and the fairness of the situation, high housing costs and educational disparities are the main causes of Santa Barbara's ongoing poverty. At the same time, setting goals to implement the best practices in public funding and coordinating resources in North County to address service gaps, and consolidating services in those areas.

### Tech and Trust: The role of digital tools in Ghanaian Governance

**Team Members:** Marcos Miron, Jorge Bonilla, and Asher Schroeder

**Mentor:** Dr. Jeanne Almaraz

**Course Name:** BUS 1010

**Project Summary:** Digital technologies such as mobile phones, computers, and online platforms are transformimng governance in Ghana. However citizens' engagement and access to these tools vary, influencing the effectiveness of transparency and accountability measures. This research examines how digital tools shape government openness and citizen oversight in Ghanaian institution.



### **Climate Change and Water Access: Building Long Term Solutions for Southern California**

**Team Members:** Miranda Cruz, John Rodriguez Carrasco, and Brandon Huang

**Mentor:** Dr. Jeanne Almaraz

**Course Name:** BUS 1010

**Project Summary:** Southern California struggles with droughts and water shortages made worse by climate change. Many communities struggle with access to clean water and sanitation. Our project aims to explore strategies, new technologies, and sustainable policies that can be developed to build long-term solutions and help protect water access for communities in the future.

### **How Have Invasive Grasses Altered Fire Regimes and Biodiversity in California?**

**Team Members:** Joseph Evangelista-Charbonneau, Ellian Villalobos-Torres, and Allissae Ramirez

**Mentor:** Dr. Jeanne Almaraz

**Course Name:** BUS 1010

**Project Summary:** This project studies how invasive grasses like cheatgrass and yellow star thistle worsen wildfires and harm biodiversity in California. Using expert research, it identifies restoration methods like reducing nitrogen, limiting grazing, and restoring native plants. To control invasive, improve soil stability, and protect ecosystems from frequent, intense fires.

### **Representation & Power**

**Team Members:** Alyson McKeon Postel, Amani Smith, Pedro Garcia-Dominguez, and Aidan Zepeda

**Mentor:** Dr. Jeanne Almaraz

**Course Name:** BUS 1010

**Project Summary:** Developing countries like Ukraine need a stronger voice in global institutions to promote fair decision making. Greater influence would help Ukraine recover from war, strengthen security, and support growth. Empowering these nations creates a more balanced and inclusive global system that encourages lasting development and cooperation.

### **Humans Upgrading, Sea Life Degrading**

**Team Members:** Alyssa Gonzales, Israel Flores, Diego Flores, Yana Reyes,

**Mentor:** Ava-Kathryn Capossela

**Course Name:** BUS 1010

**Project Summary:** Through the course of history, humans have innovated and advanced our everyday lives. Bikes to cars, paper bags to plastic bags, roads to cement. However, while we are upgrading our ways of life, sea life is on a negative, declining path. Sea levels are rising, pollution is increasing, and marine life is dying.



## Addressing Water Pollution in Southern California: Integrating Technology, Education, and Policy for Sustainable Clean Water

**Team Members:** Lucius Pineda, Angelo Gonzalez, Jacob Alvarez, and Richard Rios

**Mentor:** Dr. Jeanne Almaraz

**Course Name:** BUS 1010

**Project Summary:** Our project focuses on UN sustainable development goal number six, clean water and sanitation. We researched water pollution in Southern California and explored strategies and technologies that can help reduce its impact on people and the environment. Through our review of studies on stormwater runoff, wastewater contamination, and harmful algal blooms, we found that pollution continues to affect beaches, rivers, and marine ecosystems across the region. Research from Ventura and Orange County shows that urban runoff during heavy rain carries harmful bacteria, trash, and chemicals into local waterways, threatening public health and wildlife. Strengthening environmental policies and investing in sustainable infrastructure are also key to long-term solutions. Overall, our project highlights how technology, education, and policy must work together to protect southern California's water and promote a cleaner, healthier future.

## Understanding Substance Abuse in California's Young Adults: Causes and Barriers to Recovery

**Team Members:** Shayla Winterbotham, Julian Lopez, Teariah Ruff, and Robert Thomas

**Mentor:** Dr. Jeanne Almaraz

**Course Name:** BUS 1010

**Project Summary:** Substance abuse among young adults in California is impacted by social media influence and mental health struggles. Our research explores these factors and investigates barriers to seeking treatment within Los Angeles County, including high costs and limited access. Findings highlight the need for affordable care and better mental health education.

## Overcoming Employment Barriers: The Experience of Students, Immigrants and Individuals with Criminal Records

**Team Members:** Prakhar Dagur, Arjun Karthik, Alexa Ramirez, and Jacqueline Lopez

**Mentor:** Ava-Kathryn Capossela

**Course Name:** BUS 1010

**Project Summary:** Employment has been proven to be very difficult for those who are in certain impacted groups. These groups include convicts, students, and immigrants. Our research shows how these groups are the most needy individuals in the job market due to hardships and the funding needed to get a job or even get the required education and/or training to attain a job.



### **Investigating Causes and Campus-Based Interventions for Student Mental Health Challenges in U.S. Higher Education**

**Team Members:** Mariam Hussain, Nelson Tran, Ailyn Nunez, and Marcelo Quirk

**Mentor:** Dr. Jeanne Almaraz

**Course Name:** BUS 1010

**Project Summary:** This research examines how U.S. colleges address rising mental health challenges among students. It explores key causes such as academic stress, social isolation, and barriers to counseling, while analyzing how campuses respond through mental health campaigns, digital support programs, and initiatives that promote openness, community connection, and long-term student well-being.

### **Digital Governance and Accountability in Ghana: How Technology Shapes Transparency**

**Team Members:** Jorge Bonilla, Marcos Miron, and Asher Schroeder

**Mentor:** Dr. Jeanne Almaraz

**Course Name:** BUS 1010

**Project Summary:** This study examines how digital technologies influence transparency and accountability in Ghana's government institutions. While e-government initiatives like open data and mobile reporting have improved access and participation, corruption remains persistent. Findings reveal that limited internet access, weak law enforcement, and institutional barriers restrict technology's full impact on governance reform.

### **Powering Ghana: Clean, Renewable, and Affordable Energy Solutions**

**Team Members:** Diego Andrade, Joseph Johnstone, Aaron Castellanos, and Caleb Soriano

**Mentor:** Dr. Jeanne Almaraz

**Course Name:** BUS 1010

**Project Summary:** Energy has become an essential human need in the 21st century, from powering the lives of millions to supporting the growth of countries all around the world. However, as the demand for energy rises, so does the price as well as supply, making access increasingly problematic for developing nations, like Ghana. Right now, Ghana faces frequent power outages and rising energy costs that stymie the country's growth. To solve these problems, the aid of other nations is needed. By providing things like resources, technology, and support, Ghana can achieve an affordable and sustainable energy future.



## Research of Hunger Within California & What Sustainable Development Goal 2 is Doing to Assist This Issue Along Side Other Policies

**Team Members:** Jagada Lynch, Joel Garcia, Alex Yilmaz, and Ryan Kim

**Mentor:** Dr. Jeanne Almaraz

**Course Name:** BUS 1010

**Project Summary:** Within California, hunger stems from many broad issues; however, the ones that seem to be prevalent are poverty, low income, and soon-to-be reduced access to SNAP. Due to this, many must choose between paying for their food or paying for housing, causing worsening in poverty and health issues. Studies show data and research that most low-income households face food insecurity and that SNAP aids millions, reducing poverty and health costs, while Sustainable Development Goal 2 (SDG2) promotes sustainable agriculture to strengthen U.S. food security.

## Food Insecurity in CSU: Social Factors and Systemic Solutions

**Team Members:** Noah Rivera, Emily Merikyan, Vivian Alvarado, and Tony Gil

**Mentor:** Dr. Jeanne Almaraz

**Course Name:** BUS 1010

**Project Summary:** Our research examines how income, housing stability, and campus inclusion contribute to food insecurity among CSU students. By comparing food assistance programs across campuses, we aim to identify effective and sustainable strategies to ensure all students have access to nutritious food essential for health and academic success.

## Comparing Rehabilitation Housing Models: Reducing Substance Use Relapse Among Formerly Homeless Individuals in Los Angeles County

**Team Members:** Sean Wilson, Jaden Evans, Nathan Santa Cruz, and Aarav Mehta

**Mentor:** Dr. Jeanne Almaraz

**Course Name:** BUS 1010

**Project Summary:** Our research explores how well rehabilitation housing programs help prevent substance use relapse among formerly homeless people in Los Angeles County. We compare L.A.'s efforts with the U.K.'s Housing First model to find what works best and how similar programs could improve recovery and housing success.



### How can large urban cities use smart power grids to integrate renewable energy sources such as solar and wind?

**Team Members:** Rui Wang, Chris Woods, Kevin Liu, Jay Patel, and Alex Yamashiro

**Mentor:** Dr. Jeanne Almaraz

**Course Name:** BUS 1010

**Project Summary:** The integration of renewable energy into large urban cities becomes possible through smart power grids which convert one-way power distribution systems into two-way networks that enable real-time management of decentralized power generation. The smart grid system operates differently from traditional power grids because it uses sensors and smart meters and predictive algorithms to manage supply and demand fluctuations in real time. The storage of solar energy during midday allows for battery-based power distribution during both power supply stability and prevent unnecessary energy losses when demand increases or renewable power output decreases. The systems operate in dense urban areas to support sustainability initiatives through reduced fossil fuel usage and decreased carbon emissions because of evening peak hours which maintains both operational efficiency and system stability. The integration of multiple green energy sources through smart grids enables large cities to establish adaptable sustainable energy systems which operate efficiently and maintain reliability for future challenges.

### How does Climate Change Affect Wildfires in California?

**Team Members:** Danna Ayala, Gabriela Rabago, and Cara Chung

**Mentor:** Dr. Jeanne Almaraz

**Course Name:** BUS 1010

**Project Summary:** For our project, we chose to focus on wildfires in California. We chose climate change because it's making California wildfires worse. Rising global temperatures dry out vegetation, making it more flammable. Worsening droughts create arid conditions that, combined with wind, lead to fast and uncontrollable wildfires. To reduce wildfires, we need to reduce greenhouse gas emissions by switching to renewable energy, using sustainable transportation, and saving energy at home. Recycling and sustainable forestry also help reduce climate change and wildfire risks.

### How Policy affects Technology: A Study on US Government Policy on Education

**Team Members:** Ansh Patel, Alfredo Nava Mojarro, and Oliver Ceballos

**Mentor:** Dr. Jeanne Almaraz

**Course Name:** BUS 1010

**Project Summary:** This study examines how government policy influences the effectiveness of educational technology in U.S. schools. Synthesizing six key sources, it finds that equitable access, strong leadership, and teacher training produce the best outcomes, while misaligned implementation reduces effectiveness, highlighting the need for policies supporting access and instructional flexibility.



## Understanding Substance Abuse in California's Young Adults: Causes and Barriers to Recovery

**Team Members:** Shayla Winterbotham, Julian Lopez, Teariah Ruff, and Robert Thomas

**Mentor:** Dr. Jeanne Almaraz

**Course Name:** BUS 1010

**Project Summary:** Substance abuse among young adults in California is impacted by social media influence and mental health struggles. Our research explores these factors and investigates barriers to seeking treatment within Los Angeles County, including high costs and limited access. Findings highlight the need for affordable care and better mental health education.



# POLYX FYE PROJECTS

---

## College of Engineering

### Integrating UAV Thermal Imaging for Real-Time Wildfire Risk Assessment

**Team Members:** Samantha Aguirre, Caroline Ramos, Jackson Lambert, Dat Nguyen, and Minseo Kwon

**Mentor:** Dr. Elvira Trabanino

**Course Name:** EGR 1000/L

**Project Summary:** Pollution and wildfires are prominent problems in Southern California which have risen in recent years leading to an increase of cloud suppression and a larger fire risk for forested areas. A proposed solution utilizes thermal-imaging systems combined with drone technology to detect potential fire in vital vegetated locations.

### Feed The Beast

**Team Members:** Evan Voelker, Jason Chiem, Kameron Borneman, and Douglas Nguyen

**Mentor:** Dr. Elvira Trabanino

**Course Name:** EGR 1000/L

**Project Summary:** Combating the lack of natural biodiversity on the CPP campus is important to foster a means of supporting wildlife in the area. A possible solution is an inexpensive, outdoor, automatic feeder to be refilled by the user at their discretion.

### Reducing the Environmental Impact of AI Data Centers

**Team Members:** Fernando Guerrero, David Tran, Darren Le, Daniel Perez, and Shawn David Sapigao

**Mentor:** Dr. Elvira Trabanino

**Course Name:** EGR 1000/L

**Project Summary:** AI usage has significant environmental impacts due to the large amounts of electricity and water that data centers consume. By using a variety of renewable energy sources and closed-loop cooling systems, future data centers can significantly reduce water and electricity consumption.

### Predicting Natural Events via AI

**Team Members:** Phillip Nguyen, Jack Florio, Jose Medina, Tanuj Patel, and Nicholas Fang

**Mentor:** Dr. Elvira Trabanino

**Course Name:** EGR 1000/L

**Project Summary:** Existing pollution can be worsened in areas with low pressure systems with no reliable AI models. The solution proposed is to develop an app or website that relies on a specially trained AI model to warn civilians about possible hazards caused by pollution and weather.



### AI Data Centers Drowning in Overconsumption

**Team Members:** Lucas Lindsey, Pascual Oliver, Conner Cunniffe, and Yashab Azariah

**Mentor:** Dr. Elvira Trabanino

**Course Name:** EGR 1000/L

**Project Summary:** AI centers are using an exorbitant amount of fresh water to cool servers. A possible solution is to optimize the evaporative cooling process by capturing the steam, pressurizing it to turn it back into water, and then reusing it to further cool the data centers in a closed loop.

### Student Outreach for CPP's Ecological Awareness

**Team Members:** Steven Padilla, Santiago Zamora, Wilmur Sandaval, and Sumeet Shandel

**Mentor:** Dr. Elvira Trabanino

**Course Name:** EGR 1000/L

**Project Summary:** CPP has a great environment for its animals and plant life, however, as time has passed, the changing climate and lack of awareness has put it at risk. Hosting informative workshops would help educate students on local species and promote conservation efforts, encouraging students to support and sustain the campus' ecosystem.

### Increasing Flora at Cal Poly Pomona's Campus to Mitigate Fire Hazards and Enrich Biodiversity

**Team Members:** Ethan He, Bryan Gonzalez, Kendrick Kuo, Leon Pham, and Daniel Aguirre

**Mentor:** Dr. Elvira Trabanino

**Course Name:** EGR 1000/L

**Project Summary:** The health and safety of wildlife on the Cal Poly Pomona campus has become more important as the campus has continued to grow, leading to frequent interactions between wildlife and humans. Introducing specific plants to the campus would protect wildlife and increase campus safety by lowering the chances of dry plants catching fire in heatwaves.

### Dynamic Transformation in Transportation: Clean Air Vehicle

**Team Members:** Peter Jung, Nicholas Estrada, Zaid Kashif, Edgar Ortega, and Jayden Em

**Mentor:** Dr. Elvira Trabanino

**Course Name:** EGR 1000/L

**Project Summary:** With increase in transportation demands, many vehicles in the road rely on gasoline to move from one point to another. However, these comfortable transportation method have caused negative impact within Earth's atmosphere and air quality; therefore, we aim to find reliable and sustainable alternative, electric vehicle.



## Hydrogen Engines and the Fight Against CO2 Emissions

**Team Members:** Logan Johnson, Mildred Agraz, Fernando Alba, David Vega, and Luka Kela

**Mentor:** Dr. Elvira Trabanino

**Course Name:** EGR 1000/L

**Project Summary:** Harmful CO2 emissions from cars, planes, and boats have been damaging the Earth's atmosphere and air quality for many years since their uprising. A proposed solution to this issue is to expand the use of hydrogen engines in vehicles promoting cleaner energy alternatives that protect the planet.

## Improving the Manufacturing of Hydrogen Fueling Systems

**Team Members:** Shrinikesh Borsune, Sebastian Arizmendi, Adrian Lopez, and Chace Simpson

**Mentor:** Dr. Elvira Trabanino

**Course Name:** EGR 1000/L

**Project Summary:** The issue is how to reduce CO2 emissions from vehicles that are currently affecting earth's atmosphere and air quality. The solution is to use hydrogen fueling systems and focus on improving the manufacturing of these transportation systems.

## Maximizing Parking Availability at Cal Poly Pomona through Sensory Input and Data

**Team Members:** Jake Tyler Hernandez, Katelyn Duarte, Grigor Grigoryan, Matteo Lasquete, and Evan Sereg

**Mentor:** Dr. Elvira Trabanino

**Course Name:** EGR 1000/L

**Project Summary:** One of the biggest challenges that both students and faculty face at Cal Poly Pomona is centered around parking. Since vehicular traffic is popular at Cal Poly Pomona, parking spaces should be maximized with the addition of varying technologies. The use of sensors will effectively tackle this recurring problem.

## Optimizing parking systems utilizing LIDAR sensors and redesigning parking layout at Cal Poly Pomona

**Team Members:** Justin Yun, Heriberto Huerta Zuniga, Emmanuel Cisneros, Alexander Seth M Banares, and Melaney Tse

**Mentor:** Dr. Elvira Trabanino

**Course Name:** EGR 1000/L

**Project Summary:** Parking is inefficient on the Cal Poly Pomona campus. With the school being a commuter school, having efficient parking is quintessential to the school's success. Improving parking systems with new LIDAR sensors and refined parking layout will make parking more accessible for students and faculty.



### Redesigning Sign Structure and Legibility in order to Enhance Parking Efficiency at Cal Poly Pomona

**Team Members:** Axel Lara, Alex Sligar, Matthew Donis, Brayden Strahan, and John Sagastume,

**Mentor:** Dr. Elvira Trabanino

**Course Name:** EGR 1000/L

**Project Summary:** An aerodynamic neon sign will improve the efficiency of parking at Cal Poly Pomona for students and staff. This sign will display the amount and location of empty parking spots available to drivers, which will reduce the amount of time searching in occupied areas.

### High-Speed Rail: Connecting the Land of Opportunity

**Team Members:** Bao Pham, Giovanni Garcia, Barron Hsu, Dylan Mak, and Daniel Saad

**Mentor:** Dr. Elvira Trabanino

**Course Name:** EGR 1000/L

**Project Summary:** The problem of increasing CO2 emissions from private transportation can be addressed by optimizing and incentivizing public transportation through the implementation of bullet trains in the US.

### Optimizing Water Use With Smart Irrigation System

**Team Members:** Hamzah Adil, Dylan Tran, Jackson Killen, David Jimenez, and Daniel De Anda

**Mentor:** Dr. Elvira Trabanino

**Course Name:** EGR 1000/L

**Project Summary:** There exists a problem with water waste currently within California due to outdated irrigation systems. A potential solution is to install a system of moisture sensors and valves to create a "smart irrigation system" in order to reduce water waste and address issues as soon as possible.

### Protection of Personal Property from Wildfires with Chemo-Sensor Drones

**Team Members:** Daniel Schaller, Leonardo Gonzalez-Guzman, Ian Lee, and Zeth Ocampo

**Mentor:** Dr. Elvira Trabanino

**Course Name:** EGR 1000/L

**Project Summary:** A possible solution to the vulnerability to wildfires in Southern California is a series of chemo-sensor drones to monitor the areas surrounding Cal Poly Pomona. This system would notify all students and faculty of imminent fire danger on campus, thereby granting people extra time to prepare and evacuate safely.

### Newton's Third Bump

**Team Members:** Eliana Shin, Paul Woodward, Gabriel Salcedo, and Eden Guerrero

**Mentor:** Dr. Elvira Trabanino

**Course Name:** EGR 1000/L

**Project Summary:** Often encountered in CPP's parking structures are drivers driving over the posted speed limit, this is due to the lack of speedbumps. A solution to this problem is the use of non-Newtonian material based speedbumps which will have a softer effect on slower vehicles and greater bump effect on speeding vehicles.

### Protect Your Property: Anti-Fire Wall

**Team Members:** Ava Holtzen, Jahir Santana, Alexsandra Guzman, Aidan Arroyo, and Brandon Calderon Patino

**Mentor:** Dr. Elvira Trabanino

**Course Name:** EGR 1000/L

**Project Summary:** To solve the issue of people's personal property burning in wildfires, the solution proposed is to build a retractable wall around a structure to prevent the burning of the structure. The retractable wall will be controlled remotely by the owner.

### Fire-Fighting Drones

**Team Members:** Aniketh Nayani, Eric Hagen, Parker Chiu, Kyle Duc Vu, and Harrison Nguyen

**Mentor:** Dr. Elvira Trabanino

**Course Name:** EGR 1000/L

**Project Summary:** Protecting personal property from wildfire is becoming an ever increasing issue within California. The proposed solution is an insurance system that people use in order to have a drone deployed to their property to spread a retardant near personal property.

### Quick-Deploy Fire Shield

**Team Members:** Alex Caoili, Matthew Marks, Logan Elijah Khusit, and Thomas Gonzales

**Mentor:** Dr. Elvira Trabanino

**Course Name:** EGR 1000/L

**Project Summary:** In California, the threat of wildfire is widespread, especially when it comes to protecting personal property. To combat damage to personal property, a potential solution is a property safety shield consisting of a quick-deployable fire-resistant tarp to protect personal property from wildfire damage.



## **Portable Fire Retardant Dispersal System for Communities Affected by Wildfires**

**Team Members:** Ethan Field, Victor Avila,  
Enrique Orozco, and Gabriel Casales

**Mentor:** Dr. Elvira Trabanino

**Course Name:** EGR 1000/L

**Project Summary:** Wildfires are a devastating problem in California, destroying many peoples personal property. The solution proposed is a flame retardant dispersal unit, activated through an infrared sensor. This solution is meant to slow or possibly stop the fire, giving more time before the fire reaches the property.



# POLYX FYE PROJECTS

---

## College of Science

### Exploring the Feasibility and Ethicalities of Establishing a Self-Sustaining Colony on Mars

**Team Members:** Pippin Juarez, Andrew Zuniga, Marielle Secrest, Savannah Amaya, and Jahnea Ordon

**Mentor:** Dr. Homerya Sadaghiani

**Course Name:** SCI 1010/A

**Project Summary:** There has been heated discussion in the world of astrophysics about the possible colonization of Mars, especially in regard to how the planet's environmental conditions differ greatly from Earth. Our research explores the risks associated with these differences and the viability of creating a colony on Mars.

### Life on Mars

**Team Members:** Grace Dominguez, Angela Newell, and Ivan Gigliotti

**Mentor:** Dr. Homerya Sadaghiani

**Course Name:** SCI 1010/A

**Project Summary:** The idea of life on Mars has been a hot topic in the minds of scientists for centuries. Our research aims to collect geological, atmospheric, and physics-based evidence to reach a conclusion on the Red Planet's potential for life.

### Magnus Effect in Baseballs

**Team Members:** Derek Chew, Charles Young, Amanda Alvarez, and Mateo Flores

**Mentor:** Dr. Homerya Sadaghiani

**Course Name:** SCI 1010/A

**Project Summary:** The Magnus Effect demonstrates that the rotation of a projectile (in this case, a baseball) alters the direction it travels once thrown. By throwing a baseball in multiple types of rotations, a correlation between the rotation and curve the baseball travels can be observed and predicted.

### Exploring the Behavior of Objects in an Orbit around the Celestial Bodies in Space

**Team Members:** Anthony Montenegro, Seamus Sweeney, and Adrian Yent

**Mentor:** Dr. Homerya Sadaghiani

**Course Name:** SCI 1010/A

**Project Summary:** Physics is already challenging to understand, and the mysteries of space make it even more complex. Our research aims to clarify the motion of objects in space and how celestial bodies like stars and planets influence their movement, helping to explain why these objects travel the way they do.

### Why Satellites Stay in Orbit — A Two Body Problem

**Team Members:** Hayden Graham, Kevin Recinos, Myles Helgren, and Bobby Reinalda

**Mentor:** Dr. Homerya Sadaghiani

**Course Name:** SCI 1010/A

**Project Summary:** We analyze satellite orbit by modeling how orbital speed varies with altitude. Starting from the two-body formula  $v = (GM/r)^{1/2}$ , we compare theory with NASA simulations and real datasets. The results confirm an inverse relationship between velocity and radius, however, non-ideal variables (drag, oblateness) must be accounted for when designing practical missions.

### Application of Physics to MRI Scanning

**Team Members:** Kian Oda, Lucas Pulido, and Miguel Pinedo

**Mentor:** Dr. Homerya Sadaghiani

**Course Name:** SCI 1010/A

**Project Summary:** MRI scans are essential to doctors and the medical field as a way of seeing the body's internal muscles and tissues to detect issues in a non-intrusive way. However, it is especially interesting to see the physics behind it -- in the ways of electromagnetism and radiofrequency -- which our research investigates.

### The Physics Behind the Acoustics of the Marimba

**Team Members:** Ephraim Tupe, Sebastian Woller, Alex Xie, and Ximena Quinones

**Mentor:** Dr. Homerya Sadaghiani

**Course Name:** SCI 1010/A

**Project Summary:** The marimba is an instrument that is often overlooked, despite being one of the most interesting studies into wave behavior and resonance. Through our project, we seek to discover how and why resonator tubes affect the volume of the marimba.

### G-Force and Gravity: The Secret Physics of the Perfect Rollercoaster Drop

**Team Members:** Seth Schmerber, Maribel Monge, Kamryn Severy, and Jocelyn Rivas

**Mentor:** Dr. Homerya Sadaghiani

**Course Name:** SCI 1010/A

**Project Summary:** This study investigates the maximum drop height of an 87° roller coaster through analysis of energy conversion and the resultant gravitational forces. By applying Newtonian mechanics and human tolerance thresholds, this research models the optimal pull-out radius to minimize over-acceleration, ensuring a balance between rider safety and performance efficiency.

### **From Particles to Images: The Physics That Makes MRI Work**

**Team Members:** Rhea Kummari, Amanda Crawford, and Joshua Sanchez

**Mentor:** Dr. Homerya Sadaghiani

**Course Name:** SCI 1010/A

**Project Summary:** Our Project will be researching and presenting the physics and one of the key processes behind Magnetic Resonance Imaging (MRI) to our peers. We will discuss the development of MRI technology and its applications in the medical field. Our presentation explains the physics behind the nuclear magnetic resonance effect, why it works, and how this is necessary to the imaging process.

### **Gravitational Waves - How LIGO Confirmed Einstein's Theory of Relativity**

**Team Members:** Ian Maglinte, Tony Liu, Miche'l Brown, and Anlly Duran

**Mentor:** Dr. Homerya Sadaghiani

**Course Name:** SCI 1100/A

**Project Summary:** LIGO confirmed Einstein's theory of relativity through its detection of gravitational waves. In 2015, they observed ripples in space-time created by a binary black hole merger. These signals matched Einstein's predictions, providing direct proof of gravitational waves, which help transform our understanding of gravity and the universe.

### **Exploring the Relationship Between Low Birth Weight and Housing Lead Risks**

**Team Members:** Arron Ibarra, Zusana Jardon Figueroa, and Andres Arguijo

**Mentor:** Dr. Janel Ortiz

**Course Name:** SCI 1100/A

**Project Summary:** Historic use of lead in housing has posed a potential health risk in certain communities. Using CalEnviroScreen, we analyzed low birth weight and lead risk in Southern California. Our findings indicated areas with low birth weight had higher housing lead risks, showing how housing disparities pose health risks.

### **The Effects of Harmful Emissions on the Health of Communities**

**Team Members:** Diego Garcia, Jake Laurel, and Danika Jimenez

**Mentor:** Dr. Janel Ortiz

**Course Name:** SCI 1100/A

**Project Summary:** This study focuses on the impact of airborne pollution on rates of cardiovascular disease and asthma. Using CalEnviroScreen 4.0, we found higher prevalence of these conditions amongst communities with higher presence of toxic releases and traffic density. This highlights the need for environmental justice in affected communities.

## **Southern California Air Pollution and Human Health**

**Team Members:** Ahmad Sanford, Jacqueline Dominguez, Ray Angel, Davin Gordon, and Nicolas Ovalle

**Mentor:** Dr. Janel Ortiz

**Course Name:** SCI 1100/A

**Project Summary:** Air pollution affects millions of Californians, with many people being exposed to hazardous pollution. This study investigates how air pollution impacts human health using CalEnviroScreen data and local air quality samples of PM 2.5 and asthma. Results show higher pollution leads to increased respiratory risks, highlighting the urgent need for environmental justice and cleaner communities.

## **How Harmful Water Contamination Affects Low Income Populations**

**Team Members:** Christina Hernandez, Andrew Ventura, and Christopher Ocampo

**Mentor:** Dr. Janel Ortiz

**Course Name:** SCI 1100/A

**Project Summary:** Low-income communities have been victims of water contamination. Using CalEnviroScreen, we plan to analyze poverty rates and water contamination levels. Our research is important because this is a real-world issue that is still affecting thousands of low-income communities.

## **Detecting The Invincible: Gravitational Waves**

**Team Members:** Jesus Acosta, Israel Rocha, Evan Johiro, and Kervin Garcia

**Mentor:** Dr. Homerya Sadaghiani

**Course Name:** SCI 1010/A

**Project Summary:** We use data collected from the LIGO to prove the existence of Gravitational Waves and confirm Einstein's theory of relativity about gravitational waves.

## **Invisible Impacts of Water Contamination**

**Team Members:** Thomas Bedolla, Lyla Castaneda, and Andrew Ybarra

**Mentor:** Dr. Janel Ortiz

**Course Name:** SCI 1100/A

**Project Summary:** Invisible Impacts of Water Contamination Over 1.7 million people drink contaminated water. This study aims to identify patterns in water samples and how different environments affect ecosystems. A collection of water samples used from the Los Angeles area. It will be found that areas in Southern California with high contamination will have high protist diversity. These results will show how ecosystems will be affected by water contamination, emphasizing the future cost of pollution on ecosystems.



### **Beneath the surface: How polluted waters silence protist diversity**

**Team Members:** Dhalia Navia, Liliana Nunez, Isabella Rodriguez, and Jose Ramirez

**Mentor:** Dr. Janel Ortiz

**Course Name:** SCI 1100/A

**Project Summary:** Polluted waters can make a drastic change in protist diversity by affecting food webs and habitats. The goal of our study is to find out how contaminated water can affect protist diversity. We collected water samples and analyzed them for contaminants and protists. Contaminated water shows slightly less protist diversity. Further research is needed to expand our studies.

### **Hazardous Waste Effects on Livelihoods**

**Team Members:** Shakari Sykes, Joel Munoz, Fernando Majin, and Christian Hernandez

**Mentor:** Dr. Janel Ortiz

**Course Name:** SCI 1100/A

**Project Summary:** Our study focuses on relationships between hazardous waste and people's livelihoods, asking the research question: What are the negative effects of hazardous waste on the human condition? Using CalEnviroScreen, we found negative relationships between hazardous waste and life quality. Our findings can guide structural improvements on cities.

# ACKNOWLEDGEMENT

---

We want to start by celebrating our outstanding student presenters. Your creativity and innovation in your PolyX projects have been the cornerstone of the PolyX FYE Showcase's success, and we are deeply inspired by your passion and dedication.

A heartfelt thank you goes out to everyone who helped make this event possible. To our faculty, staff, and peer learning assistants, your mentorship and unwavering support have played a crucial role in shaping our students' achievements. To our valued partners, including Office of Academic Innovation, Career Center, First Year Experience, and University Advancement, your generosity and commitment have been instrumental in bringing this showcase to life.

Finally, we extend our gratitude to all attendees for joining us in recognizing the remarkable accomplishments of our students and the transformative impact of the Polytechnic experience. Your presence made the PolyX FYE Showcase truly memorable.

**Thank you for being an essential part of this journey!**