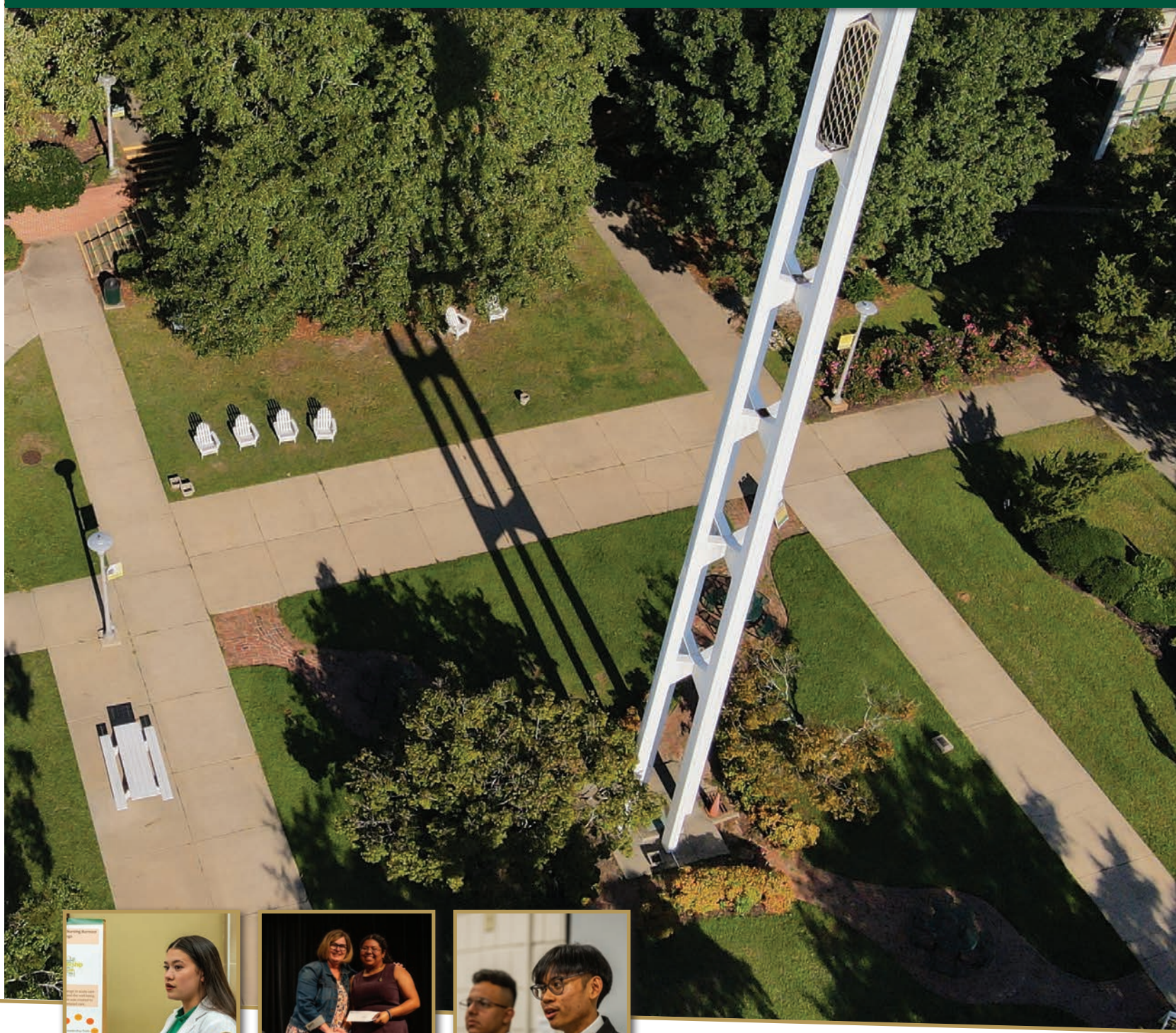
THE 14TH ANNUAL

CENTER FOR RESEARCH & CREATIVITY SYMPOSIUM



METHODIST UNIVERSITY

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MISSION STATEMENT OF THE METHODIST UNIVERSITY CENTER FOR RESEARCH & CREATIVITY

The mission of the Methodist University Center for Research & Creativity is to establish educational opportunities that are collaborative and inquiry-based with the intention that every Methodist University student has access to exploratory learning across the curriculum.

"Faculty research and creativity are at the heart of the academic endeavor. Not only do these activities help to create new knowledge and new experience, but they add tremendously to teaching and learning. This work models for students the academic rigor and care involved in knowledge production, engages students in the process itself, and helps students become more critical information consumers for the rest of their lives — a vital skill in today's environment."

– Dr. Stanley T. Wearden
President

WEEK AGENDA | APRIL 8-11, 2025

Tuesday | April 8		
1-4 p.m.	Eighth Annual Nursing Research and Community Symposium	Chaffin Building
7 p.m.	Dr. Sue L. Kimball Writing Competition Readings	Huff Concert Hall
Wednesday | April 9		
9-11 a.m.	The 14th Annual Center for Research & Creativity Symposium: Morning Presentation Session	See Program for Locations
11 a.m.-Noon	CIRCUIT: "MU 2025 Spring Break Mission Team"	Matthews Chapel
Noon-2 p.m.	The 14th Annual Center for Research & Creativity Symposium: Afternoon Presentation Session	See Program for Locations
2-3 p.m.	The 14th Annual Center for Research & Creativity Symposium: Poster Session*	Berns Student Center
3:30-5 p.m.	University Awards Ceremony	Huff Concert Hall
6 p.m.	Phi Kappa Phi Induction Ceremony	Stout Physician Assistant Complex (Medical Lecture Hall)
7:30 p.m.	B.F. Stone Lyceum - "Rx For Disaster: The Opioid Crisis, the Forgotten Patient, and the Search for the True Criminal"	Stout Physician Assistant Complex (Medical Lecture Hall)
Thursday | April 10		
11 a.m.	Great Truths without Division: Panel Discussion	Union-Zukowski Lobby and Gallery
4-6 p.m.	Great Truths without Division: Flower Body Ink Painting Workshop	Union-Zukowski Lobby and Gallery
6-8 p.m.	Great Truths without Division: China Garden Cultural Contemporary Art International Tour Exhibition - Opening Reception	Union-Zukowski Lobby and Gallery
Friday | April 11		
6-7:30 p.m.	Class of 2025 & 2026 Inaugural White Coat Ceremony & Pinning, Doctor of Occupational Therapy Program	Huff Concert Hall
Saturday | April 12		
9 a.m.-3 p.m.	Sixth Annual Occupational Therapy Student Scholarship Research Symposium	Stout Physician Assistant Complex (Medical Lecture Hall) Also Streamed Online

* Posters will be displayed in the Upstairs Lobby of Berns beginning at 9:00 a.m. Students will be available for questions during the afternoon Poster Session.

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MORNING SESSION

COMPUTER SCIENCE: APPS AND PROGRAMS | ALLISON 121

9-9:20 a.m.	Totalvirus: An Antivirus Application	Aiden Libero
9:20-9:40 a.m.	Project P.R.E.P: The Time Has Come	Charles Gaffney
9:40-10 a.m.	The Company Calendar Program	Jakob Fick
10-11 a.m.	Available for Q&A	

INTERDISCIPLINARY: SPORTS AND MENTAL HEALTH, STATS VS. PERCEPTION | HENDRICKS 122

9-9:20 a.m.	Machine Learning Applications in Tennis	William Johnston, Anton McCloskey
9:20-10 a.m.	Athlete's Perception of Playing Time	Kiley Hicks
10-11 a.m.	Available for Q&A	

INTERDISCIPLINARY: LITERATURE AND REPRESENTATIONS OF WOMEN | HENDRICKS 222

9-9:20 a.m.	Archetypal Literature	Alaina Martin
9:20-9:40 a.m.	Death of the "Magical Girl": Death, Self-Sacrifice, and Emotion Culture in Eastern Animated Media	Kayla Clark
9:40-10 a.m.	Nomadic Tibetans: Traditions and Transformations Through Time	Shimba Onishi
10-10:20 a.m.	Netizens: The Online Generation	Deaja Chaney
10:20-11 a.m.	Available for Q&A	

INTERDISCIPLINARY: SUSTAINABILITY AND ENGINEERING | CHAFFIN 103

9-9:20 a.m.	Sustainability Practices at Methodist University: A Case Study of the Chaffin Building	Han Wu, Colin Kistner Jorge Sanchez, Jaden Tuttle
9:20-9:40 a.m.	Sustainability and Engineering Assessment of Clark Hall: Challenges, Innovations, and Recommendation	Daniel Wright, George Skenteris Noah Atkinson, Micaela Corvera Vargas Ty'Juan Wiley
9:40-10 a.m.	Sustainability Practices in Davis Memorial Library	Kyle Molivas, Minemin Singvongsa Joseph Do, Jamil Young
10-11 a.m.	Available for Q&A	

PSYCHOLOGY: MEMORY AND TRAUMA | CLARK HALL (YARBOROUGH AUDITORIUM)

9-9:30 a.m.	Mind Matters: Exploring Neuropsychological Influences on Visuospatial Processing and Memory	Jacqueline Duede, Sadie Melody Ariel Duran, Jamiah Davis Rebekah Haigler, Jamie Holton Nonsindiso Geza
9:30-10 a.m.	The Impact of Generational Trauma on Academic Resilience	Jocelyne Lopez Cruz, Eliana Menlik Xavier Powers, Nicholas Knighton Shayle Green, Johnathan Chestnut Nathaniel Moore, Sherayne Graham Aaron Potter

AFTERNOON SESSION

INTERDISCIPLINARY: FORENSICS AND CYBERSECURITY | ALLISON 121

Noon-12:20 p.m.	A Qualitative Photographic Comparative Analysis of Ballistic Projectiles in a Range of pH	Rebecca McGaughnea
12:20-12:40 p.m.	Understanding Adversarial Attacks on AI-Powered Cybersecurity Systems	Jehobia Sharon Jujin Premakumar
12:40-2 p.m.	Available for Q&A	

INTERDISCIPLINARY: POWER AND THE UNDERSERVED/UNDERREPRESENTED | HENDRICKS 122

Noon-12:20 p.m.	Empowering Underserved Communities: A Scalable Solution for Financial Inclusion	Dorvie Onfoula
12:20-12:40 p.m.	What Are the Harmful Social Impacts of Predictive Analytics?	Nsimbo Mponezya
12:40-1 p.m.	Who Governs the Freed?: The Fragility of Federal Power in Beaufort County	Heba Mansaf
1-2 p.m.	Available for Q&A	

ENGINEERING: CAPE FEAR HEALTH AND RIVER WATER | HENDRICKS 222

Noon-12:20 p.m.	Cape Fear Valley Social Determinants of Health (SDOH)	Mariah Blanco Joseph Do Tsetan Dolkar Jorge Sanchez
12:20-12:40 p.m.	Application of Lean to Reduce Blockage in Throughput	Noah Atkinson Diego Ramiro Ty'Juan Wiley Jaden Tuttle
12:40-1 p.m.	Financial Analysis of Proposed Closed-Loop Cooling Solution	Banks Engle Kellen Pace Jackson Barriger Na-Ubangiji Ali Dawood
1-2 p.m.	Available for Q&A	

INTERDISCIPLINARY: AI AND HIGHER EDUCATION | CLARK HALL (YARBOROUGH AUDITORIUM)

Noon-1 p.m.	Why AI Hasn't Transformed Higher Education (Yet?): A Complex Adaptive Systems Perspective on Adaptation and Resistance	Rishika Singh Asemahle Mgayi
1-2 p.m.	Available for Q&A	

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POSTER SESSION | 2-3 P.M.

The Hidden Effects of Kratom: Assessing its Potential Impact on Reproductive Health through C. *elegans* ..... **Caleb Mott**
Biology
Advisor: Dr. Lauren Klabonski

Investigating Kratom's Influence on Dopamine and Serotonin Pathways in *C. elegans* ..... **Rishika Singh**
Biology
Advisor: Dr. Lauren Klabonski

Comparison of Maternal Milk and Commercialized Formula Under Low Magnetic Field Strengths and Probing Inhibitory Properties of Common Gastrointestinal Pathogens ..... **Allison Haché**
Biology
Advisor: Dr. Lauren Klabonski
Chemistry
Advisor: Dr. Vijay Antharam

Addressing the Impact of SES on K-12 Student Academic Performance ..... **Aneesa Irizarry**
Education
Advisor: Elizabeth Schrecengost

Finding Your Way Around Campus ..... **Logan Florio, Joshua Crabtree, Nick Spinola**
Engineering
Advisor: Dr. Denise Bauer

Wayfinding Around Campus ..... **Luke Albright, Davis Linhardt, Michael Heis, Alex Ramson**
Engineering
Advisor: Dr. Denise Bauer

Live Off-Campus or On-Campus?: An Economic Analysis ..... **Josh Mott, Brett Redmond, Davis Linhardt, Hailey Jernigan**
Engineering
Advisor: Dr. Denise Bauer

The Ideal Meal-Prep for This Economy ..... **Ahmed Azeez**
Engineering
Advisor: Dr. Denise Bauer

Student Jobs ..... **Tyrone Atkinson Jr., Aleksandar Long, Jasaia Young**
Engineering
Advisor: Dr. Denise Bauer

Writing and Tutoring Center Spaces: Walk-in Sessions ..... **Cyrus Bretz, Alianna Gonzalez, Grayson Slusher, Gerardo Selva**
Engineering
Advisor: Dr. Denise Bauer

Berns Student Center: What It Should Be ..... **Ethan Carlyle, Kevin Landaverde-Delgado, Daiveon Fisher, Minh Hoang**
Engineering
Advisor: Dr. Denise Bauer

Remodeling of Berns Student Center ..... **Anthony Reed, Tyler Jay Mossman, Dylan Kabale**
Engineering
Advisor: Dr. Denise Bauer

Economic and Non-Economic Factors of Renovating the Mallett-Rogers House Parking ..... **Camden Hancox, Sebastian Pirela Fraioli, Devin Blake Tucker**
Engineering
Advisor: Dr. Denise Bauer

Enhancing the Spectator Experience: A Redesign of Stadium Seating at Methodist University ..... **Jamil Young, Montravious Willoughby**
Engineering
Advisor: Dr. Denise Bauer

Reducing Cafeteria Wait Times at Methodist University ..... **Jakob Fick, Banks Engle**
Engineering
Advisors: Dr. Girish Upreti

Closed-Loop Cooling at Kuraray America, Inc. ..... **Banks Engle, Kellen Pace, Jackson Barriger, Na-Ubangiji Ali Dawood**
Engineering
Advisor: Dr. Girish Upreti and Dr. Denise Bauer

Cape Fear Valley Social Determinants of Health (SDOH) ..... **Mariah Blanco, Tsetan Dolkar, Jorge Sanchez, Joseph Do**
Engineering
Advisor: Dr. Girish Upreti and Dr. Denise Bauer

Improving ED Throughput for Cape Fear Valley Hospital ..... **Noah Atkinson, Diego Ramiro, Ty'Juan Wiley, Jaden Tuttle**
Engineering
Advisor: Dr. Girish Upreti and Dr. Denise Bauer

Exploring Functional Capacity Programs for Athletes Post-Concussion: A Scoping Review ..... **Morgan E. Lane**
Occupational Therapy
Advisor: Matthew Foreman

An Exploratory Study on the Mental Health Aspects of Collegiate Tennis Athletes ..... **Taylor Parrott, Riley Brewington, Nadeem Jaber**
Occupational Therapy
Advisor: Matthew Foreman

Exploring the Relationship Between Fine Motor Function and Quality of Life for Individuals with a Parkinson's Disease Diagnosis ..... **Emily Thorne**
Occupational Therapy
Advisor: Matthew Foreman

The Use of Assistive Technology by Occupational Therapy Practitioners Working with Older Populations to Support Successful Aging in Place ..... **Morgan Nash**
Occupational Therapy
Advisor: Dr. Annabeth Knight and Dr. Matthew Foreman

Exploring Women's Knowledge of the Signs and Symptoms of Pelvic Floor Dysfunction and its Impact on Occupational Performance ..... **Alexus Alston, Lexus Freeman**
Occupational Therapy
Advisors: Dr. Charlotte Navarro

Developing an ICU Delirium Protocol Based on Current Healthcare Procedures: A Survey Study ..... **Hannah Brumley, Makenzie Lawton**
Occupational Therapy
Advisors: Dr. Charlotte Navarro

The Effects of Therapy Dogs on Stress Levels in Undergraduate College Students During Final Exam Weeks ..... **Jessica Renken**
Occupational Therapy
Advisor: Dr. Sheri Michel

Early Childhood Educator Perspectives on the Supports and Barriers Available for Behavior Management in Early Childhood Classrooms ..... **Sherelle Jackson, Hailey Whitter**
Occupational Therapy
Advisor: Dr. Meredith Gronski

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The Eighth Annual Nursing Research & Community Symposium

April 8 | 1-4 p.m.

Dying to Give Birth: Black Motherhood in America

Jalessa Batchelor

African American women experience maternal death and birth complications three to four times more likely than any other ethnic group. Despite dramatic communication such as technology and medicine, the rates of these women continue to be the highest. Is it possible that factors such as knowledge deficits of the mothers, lack of knowledge from the healthcare team, lack of education from providers, comorbidities, socioeconomic influences, and/or unconscious bias of the healthcare team can contribute to this phenomenon? This scoping review was guided by many articles and statistics comparing the increased rates of African American women and other races. This review attempts to identify the various factors that contribute to the increase in maternal death in African American women, as well as the increase in maternal complications during the birthing process. It will also identify successful strategies that the healthcare team can employ to decrease the risk of injury. If time and effort, as well as proper education, are provided, the rate of women dying will decrease.

Incidence of Postural Orthostatic Tachycardia Syndrome in Young Adults Following COVID-19 Recovery

Callie Baucom

This scoping review will investigate the post-viral onset of Postural Orthostatic Tachycardia Syndrome (POTS), which is a condition characterized by an abnormal drop in blood pressure accompanied by an increase in heart rate when changing positions. This is often joined by symptoms such as dizziness, fatigue, and possible loss of consciousness. Recent studies have highlighted a significant association between COVID-19 and the development of POTS, particularly among young adults under the age of 40. Since the onset of COVID-19, there has been a marked increase in the rate of POTS from 1.42 cases per 100,000 person-years to 20.3, that represents an increase of more than 1,400%. The increase has been strongly linked to post-viral syndrome after successful recovery from COVID-19. This finding emphasizes the necessity for medical professionals to take POTS into account when making a differential diagnosis during the post-viral symptoms of young adults. Additionally, POTS and Inappropriate Sinus Tachycardia (IST) are becoming important clinical problems in pediatric and adolescent populations after COVID-19. This demonstrates the virus' broader impact on conditions of the autonomic nervous system across a range of age groups. The data suggests that young adults recuperating from COVID-19 have a significantly higher frequency of POTS. This emphasizes how crucial it is to identify and treat POTS in this population early on in order to lessen its long-term health effects.

Nurturing Young Minds: Evidence-Based Nursing for Pediatric Neurological Disorders

Kaitlyn Beaver

Future outcomes for children with neurological illnesses are dependent upon our care as nurses to give them the best quality of care they may receive in different stages of their illness. Nurses must take on an important and proactive role in order to ensure that these kids get the greatest possible outcomes. The nursing management of pediatric neurological disorders includes monitoring brain development, directing patient care, and family-centered support. This paper applies a case-study approach using Johnson's Behavioral Systems Model (BSM) to address the care needs of children. The BSM serves as an excellent framework to guide the planning of nursing care by systematically addressing each induvial system, i.e., elimination, respiration, nutrition. This comprehensive approach goes beyond routine care such as vital sings, assessing the patient's condition, and administering medications. Early nursing intervention, caregiver education, and interdisciplinary collaboration can improve quality of care while improving patient outcomes. By advocating for patients and educating caregivers with the needed knowledge regarding early symptoms, nurses can facilitate timely medical intervention. As we highlight evidence-based nursing intervention and management strategies for children with neurological disorders, we can see the impact of nursing education, interdisciplinary teamwork, and standard protocols on patients' outcomes and quality of care.

Neonatal Abstinence Syndrome: What are the Long-Term Developmental Effects?

Taylor Ann Collier

This review will attempt to build a better understanding of Neonatal Abstinence Syndrome (NAS). NAS is a common and preventable cause of injury to the newborn that can have long-term effects. This is to include, motor, speech, behavior, poor birth rate, sudden infant death syndrome (SIDS), and many more concerning factors. The recent epidemic rise in opioids and heroin has led to a significant rise in the rates of NAS, affecting over 20,000 births annually. Furthermore, disadvantaged women often do not receive the necessary education or help with prenatal care due to embarrassment and shame. Many health care providers fail to fully understand this issue and the long-term effects. It is hoped that this review can bring awareness to the topic and perhaps decrease the rise in cases of NAS.

GLP-1 Antagonists vs. Natural Weight Loss Strategies: The Effect on Cardiovascular Health for Obese Patients

Dawson Corbett

Obesity is one of the main comorbidities that affects cardiovascular health; losing weight has been a key factor in improving vascular health. However, the effects of natural weight loss compared to medication-based weight loss on cardiovascular health needs more research. This project aims to compare and contrast the health outcomes of obese patients when placed on natural weight loss protocols like diet and exercise versus patients who use medication as alternative weight loss. This study will attempt to compare obese patients, one group using prescribed Semaglutide or GLP-1 antagonists, and the other group using natural weight loss strategies focusing on portion-controlled meals, healthier food, and exercising every day. The cardiovascular data collected at each time point includes blood pressure, cardiac function, lipid profiles, cardiac inflammatory markers, and total weight loss. The data will focus on the differences in health from baseline after six months and after 12 months; then comparisons will be made between the groups. This project highlights the potential of weight loss medications to provide more rapid and significant cardiovascular health benefits compared to natural modifications. Further research is needed to determine the long-term effects of these outcomes and to also assess whether medication interventions offer better advantages over natural weight loss strategies in improving cardiovascular health.

A Bittersweet Truth

Lydia Dieck

Sweeteners such as saccharin (Sweet-n-Low) and aspartame (NutraSweet or Equal) are common among individuals with type II diabetes as a substitute to control blood sugar while reducing caloric intake. There are recent concerns regarding the long-term health effects, particularly their association with the risk of cancer and other metabolic disturbances. Comparatively, natural sweeteners like honey, Splenda (sucralose), and sugarcane are known to be safer alternatives due to their minimal processing and potential antioxidant properties. Research suggests that prolonged use of artificial sweeteners may contribute to systematic inflammation, hyperinsulinemia, and platelet activation, which could indirectly increase susceptibility to patients with type II diabetes. Studies have shown that saccharin and aspartame consumption in diabetic patients has no definitive carcinogenic link; however, there are metabolic disruptions, such as oxidative stress. This is a state of imbalance in the production of reactive species, which could damage cellular components such as DNA. This opens the chance for mutations and increases cancer cells. On the other hand, natural sweeteners, particularly honey, exhibit anti-inflammatory and antioxidant benefits, but the downside is that they still impact blood glucose levels. As healthcare workers, we must ensure that when educating our patients about diet alternatives, we explain all the pros and cons of artificial sweeteners. Our ethical and holistic responsibility is to consider the physiological impacts on diabetic patients.

Breaking the Silence: Overcoming Barriers to Mental Healthcare for African American Men with Schizophrenia

Lailah Green

African American males diagnosed with schizophrenia face significant barriers in accessing outpatient mental healthcare. By understanding the barriers to treatment, healthcare professionals can improve health outcomes and reduce racial disparities in mental healthcare services. This review study aims to identify the barriers that prevent African American men with schizophrenia from receiving adequate mental healthcare within the first year of diagnosis. This review study compares the access provided to African American males to those who don't have as many barriers standing before them. A grounded theory is a qualitative research approach that uses data collection to generate new theories. Using the grounded theory approach, this study seeks to explore the underlying factors that contribute to these barriers. The impact of the barriers to treatment were examined. Findings suggest that stigma, finances, and distrust of non-black medical providers were the primary factors limiting these men to seek outpatient mental healthcare. It was also found that without these barriers, they were more likely

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to receive continuous care, in turn leading to better disease management and reduced hospitalization rates. Addressing barriers to outpatient mental health services to African American males with schizophrenia is important because it provides early intervention and better outcomes. Community outreach programs and education can help with long term outcomes for this group of patients as well.

Effects of Incivility on Nursing Students' Success

Kyla Hall

Incivility continues to become a problem in the nursing profession, leading to a decrease in positive professional learning behaviors to include effective communication, accountability, integrity, and clinical decision-making. Nursing students are particularly vulnerable to incivility due to the perception of powerlessness when compared to the dominant groups, namely clinical nurses, physicians, and professors; this causes inter-profession animosity. Incivility in the nursing academic setting increases pre-licensure undergraduate nursing students' physical and psychological stress, which may result in a decrease in student success particularly NCLEX-RN passing rates. This scoping review attempts to explore this relationship in the hopes of identifying strategies to prevent episodes of incivility, thereby increasing student success.

The Effect of Empathetic Nursing Care in the Intensive Care Setting

Lena Happel

In the Intensive care unit (ICU) setting, end-of-life care is unfortunately a common circumstance that occurs with many patients. Nurses have the role of providing comfort care to dying patients, which makes their care crucial. Little is known about which style of nursing care will give the best experience for the patient and their family. This review attempts to explore empathetic care, which is characterized by compassion, active listening, and trusting communication, given in the ICU as opposed to the standard of nursing care, characterized by meeting the patient's needs through evidence-based guidelines. Evidence is needed to provide nurses in the ICU which is the most effective at delivering care at the end of life.

The Impact of Nurse-Led Early Screening on Hepatic Encephalopathy Prevention in Middle-Aged Men with Chronic Alcohol Use: A Comparative Analysis

Meaghan Himes

Early recognition of alcohol-induced Hepatic Encephalopathy (HE) is critical in preventing complications and improving patient outcomes. In 2018, approximately 4.5 million adults in the U.S. had liver disease, with chronic alcohol users at significant risk (CDC, 2018). HE, a severe neurological complication of liver disease, often goes undetected until advanced stages. Nurses play a key role in early screening and prevention, making their involvement essential in mitigating HE progression. This paper examines the role of nurses in early screening and risk assessment for middle-aged men with chronic alcohol use. Various accessible tests, such as the Number Connection Test (NCT), Psychometric Hepatic Encephalopathy Score (PHES), and Stroop test, require minimal training and can be effectively used in clinical settings to identify HE at an early stage (Parker, 2020).Early detection and intervention, including lactulose administration and risk factor management, have been shown to reduce hospital admissions and lower healthcare costs. Nurse-led screening protocols can enhance early diagnosis and improve patient survival rates. This paper highlights the need to integrate standardized HE screening into routine nursing practice to ensure timely intervention for high-risk populations, ultimately improving healthcare outcomes and reducing the burden of HE-related complications.

Fetal Alcohol Syndrome: How Breastfeeding is Affected

Payton Jones

Fetal alcohol syndrome (FAS) and prenatal exposure to alcohol (PEA) have profound effects on newborns when trying to breastfeed compared to newborns not exposed to alcohol before utero, during utero, or after birth. After birth, the newborn exposed to alcohol will go into withdrawal and may have long-term memory deficits, affecting their learning ability as well as fine motor skills. Maternal alcohol consumption after birth can affect the mother's milk supply as well as affect the newborn in the same way as FAS and PEA. This review will bring forth awareness to Fetal Alcohol Syndrome by explaining what it is and its direct effect related to breastfeeding on the newborn and mother.

A Woman's Experience

Sofie Sorenson Joyce

This review of the woman's experience of achieving non-pharmacological labor support found that collectively that there is a lack of accessible evidence-based information in this realm of healthcare. According to Gillen et al. (2023) women value the support from healthcare providers when choosing the best birth plan for themselves and often feel a stigma of choosing a home birth plan. The Woman's choice in her birth is a vital aspect of her journey in creating a non-traumatic and rewarding experience. By providing unbiased evidence-based information women can make the birth plan that works best for them and their child to promote non-traumatic and exhilarating birthing experiences. The grounded theory is a system of data evaluation that, according to Noble and Mitchell (2016), is used to uncover such things as social relationships and behaviors of groups, known as social process. The grounded theory method involves data collection and analysis at the same time, because of this process, this particular theory is an excellent methodology to identify the experience of women achieving non-pharmacologic labor support.

A Case Study on Helsmoortal-Van der Aa Syndrome

Cameron Kennedy

Helsmoortal-Van der Aa Syndrome (HVDAS) is a rare genetic disorder that causes an array of symptoms such as developmental delays, motor delays and intellectual disabilities. This disorder occurs when one of the two copies of the ADNP gene (gene that is important for the development of the brain in learning and in memory) has lost their expected function. In understanding HVDAS, Johnson's theory of nursing known as the "Behavior System Model" provides insight into the care approach of individuals based with this syndrome. When a patient's behavioral subsystem is disrupted due to illness or stress, the nurses' primary goal is to restore equilibrium by providing mechanisms that support the patient's natural adaptive mechanisms. When applied to HVDAS, Johnson's model emphasizes the need for a holistic caring approach to individuals with this syndrome. This model recognizes the unique approach to inherit dignity within the community. This theory supports the patient-centered care model that ultimately adapts to the individual care that goes into a person with HDVAS. Nurses and healthcare providers who are guided by Johnson's theory are encouraged to manage environmental stimuli, encourage autonomy, support social interaction, and promote the well-being of individuals who are diagnosed with this syndrome. By integrating Johnson's theory, nurses and healthcare providers can provide an empathetic approach that improves the quality of life of these individuals.

Mitigating the Long-Term Effects of Boarding Pediatric Psychiatric Patients in the Emergency Department

Dallas Lee

With the rise in mental health problems, it is imperative that we do not overlook the most susceptible of our psychiatric patients, the children. There are a significant number of pediatric psychiatric patients being boarded in emergency departments nationally. These extended stays can lead to a multitude of problems for the children. Due to the circumstances, these patients are not having their needs met which will ultimately lead to developmental issues. Moreover, this can be a traumatizing experience for any child, let alone one that is already suffering from a mental health crisis. This review attempts to identify the interventions that can be put in place to help mitigate the long-term effects of extended psychiatric holds for the children. Between including a child life specialist, behavioral specialist, and play therapist, along with the development of a safe play area and educational opportunities, we could see a drastic decrease in the effects suffered. With a call to action, we can have a great impact on the care provided for our vulnerable pediatric psychiatric patients.

Exploring Independence: Can Nurse Practitioners Practice without Physician Supervision?

Brianna Rado

The Safe, Accessible, Value-Driven, and Excellent Healthcare (SAVE) Act is a legislative bill in North Carolina designed to grant Advanced Practice Registered Nurses (APRNs) the autonomy to practice independently, without the requirement of mandatory supervision. The American Nurses Association (ANA) and the American Medical Association (AMA) have presented contrasting viewpoints on the passage of the SAVE Act, offering detailed reasoning for their positions. The review will examine the two conflicting points of view in an attempt to determine a possible path forward to end the impasse. Lewin's Theory will serve as a framework for this discussion to develop a balanced and practical policy resolution.

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Applying Watson's Caring Theory to Long-Term Pediatric Psychiatric Holds

Julianne Salancy

Long-term psychiatric holds in the emergency department (ED) heighten levels of stress, anxiety, and trauma to pediatric patients due to the unfamiliar and potentially frightening environment. With increasing lengths of stay, there is an exacerbation of mental health challenges that can exacerbate acute mental health issues and have prolonged negative effects even beyond the patient being discharged. Using Jean Watson's Theory of Human Caring, it explores the significance of focusing on the patient's emotional, spiritual, psychological well-being, by integrating a therapeutic relationship with their providers. By incorporating Child Life Specialists into the plan of care for pediatric psychiatric patients, it bridges the gaps and assists the patients with processing trauma. Additionally, it aids in refining the way they approach and look at stressful situations, while engaging in age-appropriate coping mechanisms to facilitate with healing.

Community Posters

Gaps in Care: Decreasing the SANE Nurse Shortage

Iqbal Ismaciil, Dorcas Mabamba, Leslie Brown

This community health nursing project will explore the Sexual Assault Nurse Examiners (SANE) nurse shortage and the impact it has on sexual assault survivors. Health program planning will be used to identify and develop interventions and recommendations to decrease the SANE nurse shortage.

Forever Chemicals: What You Need to Know

Mirae Jessup, Zariah Mosley, Savanna Necessary

This community health nursing project will examine everyday exposure to environmental forever chemicals and their impact on overall health. Health program planning will be used to develop interventions and recommendations aimed at ensuring individuals limit exposure to these chemicals.

Improving Sleep in NCAA Division III Student-Athletes

Alyssa Rivas, Virginia Crews, Bailey Snow

This community health nursing project will examine the quality and quantity of sleep in NCAA Division III student-athletes. Health program planning will be used to identify and develop recommended nursing and public health interventions to improve sleep in this population.

Safe, Smart, and Aware: Reducing STIs Among College Students

Melissa Salisbury, Brooke Murrell, Caroline Peterson, Margaret Roe

This community health nursing project will examine the prevalence of sexually transmitted infections among undergraduate college students living on campuses. Health planning strategies—health promotion, health protection, and risk reduction—will be used to develop interventions aimed at reducing STIs among this population.

Exploring Alcohol Consumption Patterns among College Students

Jasmin Valdes, Jennifer Byrd, Hannah Spexarth, Nancey Yonts-Caballero

This community health nursing project examines alcohol consumption among college students. Health program planning will be used to identify and develop interventions and recommendations to promote responsible alcohol use among this population.

The 14th Annual Center for Research & Creativity Symposium
April 9 | 9 a.m.–3 p.m.

MORNING SESSION | ALLISON 121
COMPUTER SCIENCE: APPS AND PROGRAMS

9-9:20 a.m.

Totalvirus: An Antivirus Application

Aiden Libero; Senior; Computer Information Technology; Fayetteville, N.C.
Advisor: Dr. Terry House, Computer Science and Computer Information Technology

Totalvirus is my attempt to replicate the application known as "Virustotal." I chose to do this project due to my major, my interest in the subject, and relevance to today's world of constantly emerging cybersecurity threats. The engine scans files utilizing a tool called YARA, an open-source pattern matching tool. I had a few challenges with using YARA and the C language, along with linking the GUI and engine, but ultimately made the program work. I plan in the future to build a database for the website utilizing PHP and MySQL, as well as adding a logging system to scans. In conclusion, my project is an antivirus program replicating Virustotal. It is an AV engine written in C and Python. I achieved my goal during this project, but there is certainly lots of room for improvement. Future features I might strive to include are real-time scanning, AI integration in threat detection, and an AI analysis of code within uploaded files.

9:20-9:40 a.m.

Project P.R.E.P: The Time Has Come

Charles Gaffney; Senior; Computer Science, Mathematics; Fayetteville, N.C.
Advisor: Dr. Terry House, Computer Science and Computer Information Technology

Project P.R.E.P (Program Ready for Emergency Preparation) is a web app designed through JavaScript and Python as an emergency management system to let community leaders go through simulations of map layouts as well as to be a centralized hub for leaders during an emergency. Throughout time, there have always been forms of disasters. In the modern age, we have the opportunity to watch and manage these disasters and simulate response through technological means. A leader opening this app is presented with a map of the area and local weather information. From other pages, the leader is able to report an event or issue to be posted to the map or see the data currently reported. For the simulation aspect, various simulation options can be chosen allowing the user to view a version of the map page according to the simulation data chosen. This allows the user to be more prepared for if similar events in the future happen by having an idea of what the map may look like during such an event. In 2023, the early stages of this program were shown with a focus on simulation aspects. After additional work last semester and since then, progress has been made on cleaning up the design as well as adding and completing planned and additional functionality for the project. The demonstration of this program will be presented through slides with a potential for a live demo.

9:40-10 a.m.

The Company Calendar Program

Jakob Fick; Senior; Engineering, Mathematics, Computer Science; Fayetteville, N.C.
Advisor: Dr. Terry House, Computer Science and Computer Information Technology

Many companies face issues with the scheduling and coordination of events and meetings. Often, miscommunication can cost companies a lot of time and money. To fix this problem, I created a program that will act as a calendar program for large companies. The program functions much like a Google Calendar app. Users can create events and remove them from their schedule, and the events will appear on screen as rectangles. The size of these rectangles will be proportional to the length of the event, and the position will represent the start and end time of the event. One change to my program is that the system keeps record of each employee and who their boss is, as well as who the subordinates of each employee are, if they have any. Employees will not only be able to view and edit their own schedule. Managers will also be able to view the schedules of their subordinates and make changes to those schedules as needed. Additionally, the calendar program will also be able to interact with other programs, such as the company's website. This will allow customers to schedule appointments with certain employees using the company website. When this is done the scheduled meeting will automatically appear on the employee's calendar. Additionally, if a customer wishes to schedule a meeting will a company representative. The program will determine what times at least one representative has no events scheduled. These available times will be shown to the customer so they can pick one.

10-11 a.m. Available for Q&A

MORNING SESSION | HENDRICKS 122
INTERDISCIPLINARY: SPORTS AND MENTAL HEALTH, STATS VS. PERCEPTION

9-9:20 a.m.

Machine Learning Applications in Tennis

William Johnston; Senior; Computer Science; Fayetteville N.C.
Anton McCloskey; Junior; Mathematics; Fayetteville N.C.

Advisor: Dr. Jie Zhou, Mathematics

In the past few years, machine learning has become one of the most prevalent methods of predictive data. Tennis—a data driven sport on the human side—involves a player who is constantly trying to guess what their opponent is going to do in order to give them an edge. Our goal is to use and test machine learning models to analyze a player's game style and guess where the "opponent" is going to hit. Parameters such as ball position, number of shots in the point, game and match score will be recorded and tested utilizing various models such as KNN, logistic regression, and a neural network to find the best fit. In past experiments, An accuracy of 77.8% has been reached. Ideally, we are looking for an accuracy of x>65%.

9:20-10 a.m.

Athlete's Perception of Playing Time

Kiley Hicks; Senior; Psychosocial Aspects of Sports and Coaching, Psychology; Wylie, Texas

Advisor: Dr. Jamie Robbins, Kinesiology

Competing ideas and philosophies about playing time make it a challenging issue for coaches to manage and athletes to process. Youth sport encourages practices like "half-game rules" to sustain athlete participation by increasing enjoyment (Jones et al., 2021). This addresses what Chelladurai (2012) called the "pursuit of pleasure," thereby inferring sport is not pleasurable without playing time. The NCAA prides itself on creating competitive athletic experiences, termed "pursuit of excellence" (Chelladurai, 2012). In these programs, athletes compete for playing time. Even competitive programs have different approaches to playing time allocation, depending on the sport, program goals, depth of talent, or coaching philosophies. Research into the psychology of playing time is scant (Lorentzen, 2017). Studies on youth athletes have addressed it from the standpoint of fair play (Jones et al., 2021), others have indirectly looked at playing time from a role acceptance or role-commitment (Eys et al., 2020), athlete satisfaction (Woods & Thatcher, 2009), or team cohesion standpoint (Harenberg et al., 2016). These studies revealed interactive effects, with playing time posing as an influential confounding variable, rather than the primary focus. The current proposal aims to create discussions on the topic of playing time using findings from a recent study which identified the complicated interplay between athletes' fundamental mindset and appraisal, with influential factors (i.e. team dynamics, roster size etc.), and the ultimate significance of playing time on team dynamics, the coach-athlete relationship, and the athlete' mood, attitude, and mindset. The goal of this talk is to encourage conversation about a difficult issue in sport, and suggest a useful mindset for athletes, coaches, and future professionals working with these groups to ensure a more positive experience for everyone moving forward.

10-11 a.m. Available for Q&A

MORNING SESSION | HENDRICKS 222
INTERDISCIPLINARY: LITERATURE AND REPRESENTATIONS OF WOMEN

9-9:20 a.m.

Archetypal Literature

Alaina Martin; Senior; English; Fayetteville, N.C.
Advisor: Dr. Kelly Walter Carney, English

The study of archetypal literature often centers around the analysis of reoccurring thematic patterns. These patterns are found in symbols, characters, and at times, plot. Carl Jung's theory of the collective unconscious signifies that the psyche manifests these patterns throughout all of humanity, creating a link between the individual consciousness to the universal. Through the study of significant texts such as Robert Jordan's "Wheel of Time," I was able to test the universality of this collective unconscious in literature. Through a thorough analysis of characters, plot, symbols, and themes, I found a notable interaction between the collective psyche and the stories we naturally gravitate toward.

9:20-9:40 a.m.

Death of the "Magical Girl": Death, Self-Sacrifice, and Emotion Culture in Eastern Animated Media

Kayla Clark; Senior; Computer Information Technology, Cybersecurity and Information Assurance; Fayetteville, N.C.
Advisor: Dr. Emily Leverett, English

With the birth of 21st century entertainment comes new concepts in modern media—and outstanding character archetypes are no exception. This study surrounds a particular form of character archetype presented within media today, with a focus on eastern entertainment: the self-sacrificing magical girl, otherwise known as the "mahō shōjo" character. In order to accomplish the ultimate goal of protecting the nation as perceived by the greater masses, the ultimate sacrifice of death must often be made on part of the magical girl in question. By analyzing the delicate relationship between the (chosen or otherwise self-proclaimed) magical girl and death, it can be ascertained that a strange draw and overarching correlation is discovered between that of traditional Japanese culture and the responsibility of fatal sacrifice among those forced into the line of duty for the sake of preserving one's honor.

9:40-10 a.m.

Nomadic Tibetans: Traditions and Transformations Through Time

Shimba Onishi; Sophomore; Graphic Design; Kuala Lumpur, Malaysia
Advisor: Dr. Sonali Kudva, Communication & Media

This paper explores the evolution of the media landscape in Tibet, emphasizing the complex relationship between technological progress, cultural preservation, and political suppression. Using qualitative research methods, including an in-depth ethnographic interview, this study offers a rare insight from a Tibetan woman who lived through the 1980s and modern times. This is a perspective that is absent from academic and internet-based resources. In the 1980s, with no access to newspapers and a literacy rate significantly below the global average, communication was predominantly oral, creating a reliance on word-of-mouth for news. Over time, technological advancements introduced tools like mobile phones and internet access, though these remain inaccessible to most rural and nomadic populations due to systemic barriers. While modern media technologies have brought some progress, such as an increasingly reliable source of electricity and internet throughout Tibet, they are tightly controlled by the Chinese government, serving as instruments for political propaganda and cultural homogeny. Education has also become a tool for suppressing Tibetan language and traditions, particularly in urban regions, eroding cultural identity. For nomadic communities, the lack of access to education and technological infrastructure further isolates them, perpetuating socio-economic disparities. This analysis highlights the double-edged nature of technological advancements in Tibet, which also introduces opportunities and intensifies political and cultural suppression. It aims to also highlight the urgent need for policy reform to ensure media accessibility and education that safeguards Tibetan identity and autonomy. These findings will be presented as a research paper at the symposium, allowing for discussion on media access and cultural preservation in marginalized communities.

10-10:20 a.m.

Netizens: The Online Generation

Deaja Chaney; Senior; Educational Studies; Spring Lake, N.C.
Advisor: Dr. Courtney Samuelson, Education

What are the effects of chronic social media usage on girls ages 12-18? This presentation aims to look the issues plaguing young women and what happens when they consume large amounts of content online. The presentation will be broken into three parts. The first part will be titled Sexy on main; this will be about the liberation and monetization of women's bodies leading to a rise in hypersexuality. The second focuses on the rise in anti-intellectualism that becomes normalized and leads to a complete disregard of furthering and seeking knowledge. The final part will focus on what constant online usage does for mental health. This part will seek to understand the correlation between young women's mental health and prolonged internet usage.

10:20-11 a.m. Available for Q&A

MORNING SESSION | NURSING 103
INTERDISCIPLINARY: SUSTAINABILITY AND ENGINEERING

9-9:20 a.m.

Sustainability Practices at Methodist University: A Case Study of the Chaffin Building

Han Wu; Senior; Environmental & Occupational Management; Nantou, Taiwan
Colin Kistner; Freshman; Environmental Health & Safety; Anchorage, Alaska
Jorge Sanchez; Senior; Engineering: Industrial & Systems; Hope Mills, N.C.
Jaden Tuttle; Senior; Engineering: Industrial & Systems; Greensboro, N.C.
Advisor: Joshua Freeman

This research explores sustainability practices at Methodist University, with a specific focus on the Nursing building. As sustainability becomes increasingly important in higher education, the study examines key areas such as energy conservation, waste management, water conservation, and environmental preservation. The research aims to evaluate the current sustainability measures in place at the Chaffin Building, identify challenges and inefficiencies, and propose strategies for improvement. By fostering interdisciplinary collaboration between the Environmental Health & Safety (EHS) and Engineering departments, this study ensures a comprehensive approach to sustainability. Quantitative data on the building's energy consumption will be collected and compared with the results of proposed solutions. The findings will provide evidence-based recommendations that align with environmental and institutional goals, contributing to ongoing efforts to enhance sustainability across the campus. Ultimately, this study seeks to inform future strategies, strengthening the university's commitment to environmental stewardship and resource efficiency.

9:20-9:40 a.m.

Sustainability and Engineering Assessment of Clark Hall: Challenges, Innovations, and Recommendation

Daniel Wright; Sophomore; Environmental Health & Safety; Pasadena, Md.
George Skenteris; Sophomore; Environmental Health & Safety; Fayetteville, N.C.
Noah Atkinson; Senior; Engineering, Industrial & Systems; Southport, N.C.
Micaela Corvera Vargas; Senior; Environmental & Occupational Management; La Paz, Bolivia
Ty'Juan Wiley; Senior; Engineering: Industrial & Systems; Sumter, S.C.
Advisor: Joshua Freeman

This presentation will focus on the Clark Hall building at Methodist University. Sustainability and engineering audits assessed the current environmental conditions of the building. The aim is to describe the current conditions and challenges of the building and provide sustainable recommendations and innovations in the areas of Energy Conservation, Water Management, Waste Management, and Ecosystem & Sustainability, to raise awareness and encourage more sustainable practices among its occupants. This project has a great impact because students are actively assessing the conditions of the Clark Hall building in the areas of sustainability and engineering. This will inform the university community about the conditions of the building, with the objective of proposing innovations and recommendations to work towards a more sustainable and efficient place to work and study. From a sustainable perspective, this project will assess the current sustainable condition, and practices of Clark Hall, to identify the areas where the building can improve its environmental impact with proposal and strategies, such as upgrading to an energy star HVAC system, installment of low flow appliances, encouraging waste rules, and more. Considering into account these issues about Clark Hall building from an engineering standpoint, we will implement concepts to try to significantly increase productivity, reduce the impact on our environment, and contribute to a more sustainable future in a number of areas. The team plans to use techniques like permeable pavements to lessen soil erosion, smart zoning, and AI-powered garbage management in an attempt to stop the lack of recycling.

9:40-10 a.m.

Sustainability Practices in Davis Memorial Library

Kyle Molivas; Senior; Environmental & Occupational Management; Stedman, N.C.
Minemin Singvongsa; Sophomore; Environmental Health & Safety; Vientiane, Laos PDR
Joseph Do; Senior; Engineering: Industrial & Systems; Fayetteville, N.C.
Jamil Young; Sophomore; Engineering: Industrial & Systems; Estill, S.C.
Advisor: Joshua Freeman

This project aims to improve the environmental sustainability and energy conservation at Davis Memorial Library through targeted improvements in lighting systems and computer infrastructure. The current state of the library's energy consumption will be evaluated, with a particular focus on outdated light fixtures and inefficient computer equipment. The project will explore the implementation of occupancy sensors and daylight sensors to reduce the energy usage of unnecessary lighting. In terms of computer infrastructure, the project will evaluate the potential for upgrading to more energy-efficient equipment, including the use of laptops and tablets where appropriate cloud-based servers will be explored as an alternative. This project will also address the behavioral aspects of energy conservation, promoting awareness among library staff and patrons about energy-saving practices such as turning off unused equipment. By implementing these measures, Davis Memorial Library can significantly reduce its energy consumption, lower operational costs, and minimize its carbon footprint, serving as a model for sustainable practices in public institutions.

10-11 a.m. Available for Q&A

MORNING SESSION | CLARK HALL (YARBOROUGH AUDITORIUM)
PSYCHOLOGY: MEMORY AND TRAUMA

9-9:30 a.m.

Mind Matters: Exploring Neuropsychological Influences on Visuospatial Processing and Memory

Jacqueline Duede; Senior; Psychology; Raeford, N.C.
Sadie Melody; Senior; Psychology; Vass, N.C.
Ariel Duran; Senior; Psychology; Fayetteville, N.C.
Jamiah Davis; Senior; Psychology; Bunnlevel, N.C.
Rebekah Haigler; Senior; Biology; Cameron, S.C.
Jamie Holton; Senior; Psychology; Nags Head, N.C.
Nonsindiso Geza; Senior; Psychology; Durban, South Africa
Advisor: Dr. Katharine Snyder, Psychology

This study investigated the impact of sleep, stress, and handedness on visuospatial processing and memory. The Rey Complex Figure Test (RCFT), composed of 18 distinct shapes and lines, challenges visuospatial memory. Its use in this study enabled researchers to compare participants' recall across their second and third drawings. Participants' levels of stress, sleepiness, and handedness were measured using the Perceived Stress Scale (PSS), the Epworth Sleepiness Scale (ESS), and the Edinburgh Handedness Inventory (EHI), respectively. This unique research offers valuable insights into how the mind adapts to everyday cognitive challenges. Stress and lack of sleep are common neuropsychological factors faced by students that can significantly hinder memory and problem-solving abilities, making it more difficult to retain information or perform well academically (del Angel et al., 2015, Juelich et al., 2019). Meanwhile, handedness may influence individual cognitive strengths, with potential implications for how students approach tasks requiring visuospatial skills, such as drawing, design, or navigating complex environments (Lindell, 2023). We hypothesized that heightened stress and sleepiness would impair recall performance, while left-handed or mixed-handed individuals might show a cognitive advantage due to unique patterns of brain lateralization. Our findings offer critical insights for education, clinical practice, and stress management. They suggest the importance of strategies such as stress-reduction programs, improved sleep hygiene, and individualized learning approaches tailored to cognitive differences. Future research could explore interventions to counteract the negative effects of stress and sleep deprivation on visuospatial memory or further investigate how handedness-related brain lateralization influences academic performance.

9:30-10 a.m.

The Impact of Generational Trauma on Academic Resilience

Jocelyne Lopez Cruz; Senior; Psychology; Parkton, N.C.
Eliana Menlik; Senior; Psychology; Blue Island, Ill.
Xavier Powers; Senior; Psychology; Hickory, N.C.
Nicholas Knighton; Senior; Psychology; Atlanta, Ga.
Shayle Green; Senior; Psychology; Burlington, N.C.
Johnathan Chestnut; Senior; Psychology; Stedman, N.C.
Nathaniel Moore; Senior; Psychology; Mooresville, N.C.
Sherayne Graham; Senior; Psychology; Fort Lauderdale, Fla.
Aaron Potter; Senior; Psychology; Winston-Salem, N.C.
Advisor: Dr. Katharine Snyder, Psychology

While generational trauma has been shown to disrupt psychological well-being and social functioning, its impact on academic resilience remains underexplored. Research indicates that educational institutions play a crucial role in fostering resilience, as supportive school environments and teacher relationships can significantly influence individual outcomes (Perfect et al., 2016). This study investigated the relationship between adverse childhood experiences (ACEs), generational trauma, and cognitive aspects of academic resilience among college students at Methodist University. The research focused on four key cognitive dimensions: problem-solving and strategic thinking, adaptive thought patterns, self-regulatory cognition, and academic self-reflection. Using a non-experimental quantitative design, the study employed two validated instruments: (1) The Social Readjustment Rating Scale (SRRS; Holmes & Rahe, 1967), updated by Wallace et al. (2023) to reflect contemporary student experiences, and (2) The Academic Resilience Scale (ARS-30; Cassidy, 2016), which measures students' cognitive-affective and behavioral responses to academic adversity through 30 items across four domains. The SRRS was administered in an innovative two-phase approach to capture individual and generational adverse life events experiences. Participants were recruited from undergraduate psychology classes across various academic disciplines. The study hypothesized that students experiencing higher levels of generational trauma and adverse life events would exhibit lower academic resilience. This research aims to provide critical insights into how inherited trauma shapes educational outcomes and inform the development of cognitive and behavioral strategies to strengthen resilience in vulnerable student populations. The findings could help universities create targeted support systems that empower students to overcome trauma-related barriers and achieve academic success.

10-11 a.m. Available for Q&A

AFTERNOON SESSION | ALLISON 121
INTERDISCIPLINARY: FORENSICS AND CYBERSECURITY

Noon-12:20 p.m.

A Qualitative Photographic Comparative Analysis of Ballistic Projectiles in a Range of pH

Rebecca McGaughnea; Senior; Biology, Criminal Justice, Forensic Science; Pittsboro, N.C.
Advisor: Dr. Bryan Brendley, Criminal Justice and Forensic Science

Building on prior research that examined the effects of natural environments and extreme temperatures, this experiment focuses on how varying pH levels influence the physical appearance of projectiles. The conditions included a control and 18 various pH environments: HNO3 6M (0.45), HCl 6M (1.02), HCl 3M (1.38), H2SO4 3M (1.95), lemon juice (3.35), white vinegar 5% (3.41), red wine (4.00), crushed tomato (5.02), coffee (5.34), milk (6.31), sea water from Myrtle beach (6.90), sheep's blood (7.30), sterile H2O (8.15), baking soda (9.70), dish soap (10.36), NH3 2M (12.05), drain cleaner (12.69), and bleach (12.78). The projectiles were documented and photographed before exposure to the conditions and re-evaluated after two weeks and four weeks. These photographs were analyzed for differences in visual markings and colors to see if they affected the lands and grooves or quality of the bullet overall.

12:20-12:40 p.m.

Understanding Adversarial Attacks on AI-Powered Cybersecurity Systems

Jehobia Sharon Jujin Premakumar; Junior; Computer Information Technology, Cybersecurity; Batticaloa, Sri Lanka
Advisor: Dr. Abdulrahman Hafez, Computer Science and Computer Information Technology

In today's digitized world, critical infrastructures face escalating cyber threats, necessitating advanced technologies to strengthen cybersecurity defenses. Artificial intelligence (AI) has emerged as a powerful tool for enhancing threat detection and response capabilities. However, AI models, including ChatGPT, BARD, and Bing, remain vulnerable to adversarial evasion attacks, in which malicious entities exploit weaknesses to manipulate their behavior. This study provides a comprehensive analysis of AI-driven cybersecurity models' susceptibility to adversarial attacks, focusing on their effectiveness in threat detection and risk assessment. Through empirical evaluations, we investigate how these AI systems respond to various evasion techniques, uncovering their limitations and vulnerabilities. By examining existing research, methodologies, and countermeasures, we explore the evolving threat landscape and the necessity for robust defense mechanisms. The findings highlight the urgent need for continuous advancements in AI security to mitigate adversarial risks. Strengthening AI models against evasion attacks is essential to maintaining reliable cybersecurity solutions. This research aims to inform practitioners, researchers, and policymakers on improving AI-driven cybersecurity frameworks, ensuring resilience against evolving cyberthreats.

12:40-2 p.m. Available for Q&A

AFTERNOON SESSION | HENDRICKS 122
INTERDISCIPLINARY: POWER AND THE UNDERSERVED/UNDERREPRESENTED

Noon-12:20 p.m.

Empowering Underserved Communities: A Scalable Solution for Financial Inclusion

Dorvie Onfoula; Senior; Computer Information Technology; Brazzaville, Republic of Congo
Advisor: Dr. Terry House, Computer Science and Computer Information Technology

Financial exclusion remains a significant challenge in developing countries, preventing people from accessing essential banking services, investment opportunities, and financial education. The Financial Inclusion Program (FIP) is a hybrid software solution designed to bridge this gap by providing a web-based investment module, and a mobile financial management and education module with offline accessibility. Developed using Python in the PyCharm environment, the FIP allows users to engage in fractional investing through a web platform, manage personal finances, access microfinance opportunities, and improve financial literacy. The mobile education module ensures that users can still access learning resources even when offline, making financial education inclusive. This study followed an iterative and incremental development approach, incorporating Agile methodology to continuously improve the platform. Some key features of the platform include fractional investing, currency exchange services, budgeting tools, direct investor connections, and financial education contents. The system is designed with a user-friendly interface, prioritizing accessibility for people with limited technical proficiency. A thorough testing and evaluation strategy was used to assess the functionality, user experience, and performance under different usage scenarios, incorporating feedback from CSC 3050 students. The FIP project has real-world implications, offering a scalable solution to reduce financial illiteracy. By integrating investment, lending, and literacy components, the program equips people with the tools needed to save, invest, and build wealth, contributing to economic stability and poverty reduction. This research-driven approach highlights the potential of technology in fostering financial inclusion and empowering underserved communities.

12:20-12:40 p.m.

What Are the Harmful Social Impacts of Predictive Analytics?

Nsimbo Mponezya; Senior; Accounting, Business Analytics; Dar es Salaam, Tanzania
Advisor: Dr. Robert Gmeiner, Accounting and Financial Economics

Predictive analytics is a methodology in data analytics of using historical data with mathematical and statistical techniques to build models used to predict future outcomes and trends. Predictive analytics is leveraged in various sectors such as business, healthcare, and government. The process of creating these predictive models and the results of their application have both positive and negative impacts on individuals, institutions and society as a whole. This paper aims to assess the practices used when working with data and the implications for targeted populations. Through a review of academic research and real-world examples this paper will examine the ways in which predictive analytics can reinforce systemic inequality, compromise personal privacy and influence decision making in ways that may negatively impact social welfare. Ultimately, this examination seeks to contribute to the development of more equitable and responsible predictive analytics practices that prioritize transparency, fairness, and social well-being.

12:40-1 p.m.

Who Governs the Freed?: The Fragility of Federal Power in Beaufort County

Heba Mansaf; Junior; Political Science; Cary, N.C.
Advisor: Dr. Patrick O'Neil, History

The Freedmen's Bureau in Beaufort County entered the postwar South tasked with enforcing freedom, but freedom alone did not confer power. Its agents adjudicated disputes, enforced labor contracts, and intervened in the lives of freedpeople, yet the force of their rulings was determined by the conditions that made enforcement possible rather than the clarity of the law. To govern is to be recognized as governing, and where jurisdiction was not simply defied but reinterpreted, legitimacy remained an open question. Through Bureau correspondences, contracts, and legal disputes, I trace how its power was exercised—how agents maneuvered within legal ambiguities, how freedpeople leveraged federal intervention, and how white landowners sought to minimize its influence. While previous historiography has either vilified the Bureau as an instrument of Republican control or celebrated it as a vehicle for Black empowerment, I argue that its true significance lies in the unresolved contradictions of its authority as an entity that had to constantly justify its right to act. To understand the Freedmen's Bureau in Beaufort County is to reconsider how legitimacy functions in moments of transition—relevant then, and all the more so now. The Bureau—attempting to construct a legal foundation for freedom—exposed the extent to which law is never self-sustaining; it must be enforced, upheld, and, most critically, believed.

1-2 p.m. Available for Q&A

AFTERNOON SESSION | HENDRICKS 222
ENGINEERING: CAPE FEAR HEALTH AND RIVER WATER

Noon-12:20 p.m.

Cape Fear Valley Social Determinants of Health (SDOH)

Mariah Blanco; Senior; Engineering: Industrial & Systems; Portsmouth, N.H.
Joseph Do; Senior; Engineering: Industrial & Systems; Fayetteville, N.C.
Tsetan Dolkar; Senior; Engineering: Industrial & Systems; Leh-Ladakh, India
Jorge Sanchez; Senior; Engineering: Industrial & Systems; Hope Mills, N.C.
Advisors: Dr. Girish Upreti and Dr. Denise H. Bauer, Engineering

Thousands of patients utilize Cape Fear Valley Hospital's SDOH screening services annually, yet the lack of standardization leads to inconsistent resource management across departments. Our primary goal in collaborating with Cape Fear Valley Hospital is to implement a standardized process for Social Determinants of Health (SDOH) screening that aligns with CMS standards. Currently, the hospital conducts widespread SDOH screening but lacks systematic protocols for managing identified needs. The new system will eliminate manual data entry, generating significant time and cost savings. Following our implementation approach, we will conduct a comprehensive analysis of the current screening process across five critical SDOH domains: food insecurity, housing needs, interpersonal safety, transportation needs, and utility assistance. Our team will utilize process mapping, DMAIC methodology, and root cause analysis to develop standardized protocols for resource identification in the SDOH. The proposed system will establish a common identification tool that will help ensure consistency. This solution will streamline staff workflows, improve referral accuracy, and enable data-driven resource allocation decisions. Our evaluation will thoroughly assess operational efficiency improvements, resource utilization patterns, and impact on patient care coordination.

12:20-12:40 p.m.

Application of Lean to Reduce Blockage in Throughput

Noah Atkinson; Senior; Engineering: Industrial & Systems; Southport, N.C.
Diego Ramiro; Senior; Engineering: Industrial & Systems; Lincolnton, N.C.
Ty'Juan Wiley; Senior; Engineering: Industrial & Systems; Sumter, S.C.
Jaden Tuttle; Senior; Engineering: Industrial & Systems; Reidsville, N.C.
Advisors: Dr. Girish Upreti and Dr. Denise H. Bauer, Engineering

Thousands of patients are constantly being evaluated and discharged at Cape Fear Valley Hospital every year. The constant flow of patients causes blockage in the throughput process for the patients. This causes an increase in build up within the waiting rooms and elongated stays. The main source of this blockage comes from the red zone. There is a major flow problem within the red zone, which is where the high-priority patients are held. However, these patients are being stored on beds in the hallway due to not being able to be placed in a room. Our team will investigate the utilization of the rooms within the red zone along with processing time for patient arrival and discharge. We will also be inspecting the housekeeping services, staffing and the bed cleaning process for the red zone. Our team will be utilizing a variety of engineering tools, such as DMAIC, flow mapping, time studies and a 5-why analysis. The implications of our study are that we will improve the overall throughput in the red zone, allowing for less blockage and increasing room utilization. This will allow for more patients to be seen and reduce the number of patients that do not have a room in the red zone. In turn, this will lead to an increase in patient satisfaction because the wait time will be decreased significantly, the patients will no longer be stored in the hallway, and they will be assisted sooner.

12:40-1 p.m.

Financial Analysis of Proposed Closed-Loop Cooling Solution

Banks Engle; Senior; Engineering: Industrial & Systems; Hampstead, N.C.
Kellen Pace; Senior; Engineering: Industrial & Systems; Weddington, N.C.
Jackson Barriger; Senior; Engineering: Industrial & Systems; Stuttgart, Germany
Na-Ubangiji Ali Dawood; Junior; Engineering: Industrial & Systems; Cotonou, Benin Republic
Advisors: Dr. Upreti Girish and Dr. Denise H. Bauer, Engineering

Our primary goal in collaborating with Kuraray is to design a closed-loop system that utilizes chilled water ("brine") to maintain temperature control, eliminating the constant use of cycled river water. Currently, Kuraray uses a pre-chill section on line 4 with filtered river water for temperature control. This system operated in a single-pass configuration (in and out, once), and filtered river water is discharged continuously from the system during operation. Following our design process, the full financial impact of our suggested solution will be thoroughly investigated. We will conduct a comprehensive financial analysis of our proposed design. This evaluation will include, but is not limited to, a payback analysis and/or a cost/benefit analysis. While constructing these financial analyses, key factors such as utility costs, maintenance costs, and a Bill of Materials for the proposed equipment will all be considered. Finally, we will compare the financial implications of our recommended solutions with the costs of the existing system to demonstrate the benefits of implementing our proposed solution.

1-2 p.m. Available for Q&A

AFTERNOON SESSION | CLARK HALL (YARBOROUGH AUDITORIUM)
INTERDISCIPLINARY: AI AND HIGHER EDUCATION

Noon-1 p.m.

Why AI Hasn't Transformed Higher Education (Yet?): A Complex Adaptive Systems Perspective on Adaptation and Resistance

Rishika Singh; Junior; Biology; Delhi, India
Asemahle Mgayi; Senior; Political Science; Johannesburg, South Africa
Advisor: Dr. Carl Dyke, History

General artificial intelligence (genAI) was widely expected to revolutionize higher education, yet so far its impact has been more incremental than transformative. This study uses complex adaptive systems (CAS) analysis to understand how universities respond to AI integration through the interactions of key agents—students, faculty, and administrators. By analyzing both bottom-up (student-driven) and top-down (faculty-driven) approaches, we investigate the tensions and adaptive behaviors that shape AI's role in higher education. Our research reveals that students primarily use AI as an efficiency tool, streamlining workloads without fundamentally altering their learning processes. Meanwhile, faculty responses are highly variable, shaped by their perceptions of their role in education—ranging from strict policing of AI use to cautious integration that preserves academic integrity. This variability is facilitated by institutional policies that remain largely suggestive rather than prescriptive. AI's potential to improve learning outcomes and workplace penetration are balanced with valid concerns about overreliance, ethics, and reduced critical-thinking skills by reinforcing the autonomy of faculty in setting classroom-level AI guidelines. These dynamics illustrate higher education as a nonlinear system where change is constrained by existing structures and agent resistance. The absence of systematic pedagogical shifts, coupled with the complexity of the educational ecosystem, has limited genAI's ability to drive meaningful transformation. By using CAS theory, this study highlights the intricate feedback loops and power dynamics that condition AI integration, providing a framework for understanding how technological and cultural change unfold in higher education.

1-2 p.m. Available for Q&A

28th B.F. STONE LYCEUM | APRIL 9
7:30 P.M., STOUT PA COMPLEX (MEDICAL LECTURE HALL)

The mission of the B.F. Stone Lyceum is to foster scholarly interaction among faculty, students, staff, and community residents. The endowed lecture series began in 1998 with a generous gift from the estate of B.F. ("Doc") Stone, a pharmacist from Elizabethtown, N.C. He was a respected and active member of the Methodist Church and a longtime supporter of Methodist University. The Lyceum, which consists of a lecture, two responses, and a question-and-answer period, takes place each spring and is free and open to the public.

"Rx For Disaster: The Opioid Crisis, the Forgotten Patient, and the Search for the True Criminal"

This presentation will be led by Dr. Eric See and Prof. Sarah See and will be based on their latest book, "Opioids 360," which was published in 2025 by Rowman & Littlefield. Their presentation will discuss the state of the opioid crisis in America, as what was originally viewed as a medical miracle soon turned into an apocalyptic nightmare, and will engage in a search for the true criminal, all while shining a spotlight on the forgotten pain patient.

DR. ERIC SEE
Head, Justice & Military Science Division; Professor of Criminal Justice

SARAH SEE
Assistant Professor of Criminal Justice

PAST B.F. STONE LYCEUM PRESENTATION TITLES

"Beyond Artifacts: Unveiling the Ethical Tapestry of Owning Antique Human Remains" (2024)

"Who's Gonna Carry the Boats?: Breaking Out of the 'In Crowd' in Service to Others" (2023)

"Our Diversity is Our Strength: Addressing Race and Gender in Higher Education" (2022)

"What's an Ecological Society?: A Multi-disciplinary Conversation" (2020)

AN UPDATE FROM THE CENTER FOR RESEARCH & CREATIVITY

Dr. Cameron Dodworth, Director

The annual Methodist University Center for Research and Creativity Symposium is the centerpiece of Symposium Week, with really cool student, faculty, and staff events taking place around campus all that week. As the organizing body of the annual B.F. Stone Lyceum, the CRC will continue to organize that event during Symposium Week. Furthermore, the CRC will also—soon and finally!—be publishing the first post-pandemic issue of Methodist University's student journal for research and creativity, the Monarch Review, providing our MU students with a unique opportunity to publish their research and creative work in an online, interdisciplinary, multimedia, student-run journal. The CRC will also continue to sponsor and fund student research at MU, in the form of student grants for conference presentations and research materials. Due to a comparatively much smaller budget than years past, these opportunities have decreased over the past few years, but will hopefully increase in funding as MU grows as a university in the coming years.

With all of the above in mind, the CRC would like to further encourage faculty, staff, and students to consider and produce more and more research-based and creative opportunities for our students. Collaborate with students on research and creative projects, encourage students to present those projects at academic conferences, encourage students to submit written or multimedia versions of those projects to the Monarch Review each year, and encourage—and perhaps even require—students to present their work each year at the CRC Symposium. Each student that creates a capstone project within their major is producing work that could potentially be published in the Monarch Review, if not at least be presented in-person and/or as a poster at the Symposium each spring. These are opportunities and projects that should go beyond receiving just a letter grade for a capstone course. The CRC—with its funding opportunities, the Monarch Review, and the spring Symposium—provides meaningful evidence of student work, beyond the classroom, in CVs and resumés, and that work can continue to be displayed online for students to showcase well after receiving their degrees from MU. All these students need is a member of faculty or staff to give them a little extra encouragement and motivation, and to also perhaps serve as a sponsor or advisor for a student's work. Thank you so much to all of you that have taken advantage of these opportunities, on behalf of our students, but further effort is still needed to provide our students with these valuable experiences and evidence of their success at MU—and potentially in their postgraduate careers.

The MU CRC would like to sincerely thank everyone that has worked very hard to make this year's 14th Annual Symposium possible, particularly La'Won Williams (Senior Graphic Designer), Karalee Scouten (Digital Media Coordinator), Michael Molter (Webmaster & Canvas Administrator), Eric Dowden (Monarch Press), and Brad Johnson (Director, Marketing & Communications).