

Undergraduate, Research, Scholarship and Arts. Benedictine University

# 2025 Oral Presentation Schedule April 17, 2025 \* 12:00-4:30 pm \* Goodwin Hall 212

# SESSION 1 (12:00-1:30 pm)

### Maryam Malkana, Ridwan Khader, Adeela Muzzammil, Simal Mansoor

"The Human Cost of Occupation: Exposing the Ongoing Injustice and Humanitarian Crisis in Gaza and the Broader Palestinian Struggle"

This presentation will examine the humanitarian crisis in Gaza within the larger context of the Israeli-Palestinian conflict. For decades, Palestinians have lived under occupation and blockade, facing repeated cycles of violence, displacement, and loss. We will focus on the impact of recent military operations that have left over two million people in Gaza without basic necessities—destroying homes, schools, and hospitals, and deepening an already dire humanitarian emergency. Through a combination of historical context and current reports we hope to center the lived experiences of Palestinian civilians—especially children—whose voices are often overlooked in mainstream conversations. Our goal is not only to raise awareness but to challenge the idea that neutrality is acceptable in the face of such suffering. We believe that standing with the oppressed and advocating for justice is a shared human responsibility.

Faculty sponsor: Luigi Manca

#### Rubini Karalis

"Reimagining Medieval Motifs in Modern Fantasy: Transformation, Agency, and Relational Dynamics in Marie de France's Lais and Sarah J. Maas's A Court of Thorns and Roses"

Sarah J. Maas's A Court of Thorns and Roses (ACOTAR) invites readers into a richly woven fantasy realm that blends romance with medieval themes. The narrative reimagines the motifs of transformation, betrayal, and redemption found in Marie de France's "Bisclavret" and "Yonec," modernizing these tales so they resonate with contemporary audiences. Both medieval and twenty-first-century works explore the struggles of entrapment—be it physical, mental, or emotional—highlighting the universal quest for autonomy and self-discovery. Through a comparative analysis, this paper examines the duality of characters such as Bisclavret in Marie de France and Tamlin in ACOTAR, revealing how outward monstrosity often conceals inner nobility. While Bisclavret embodies unwavering loyalty despite his beastly form, Tamlin's shapeshifting serves as a reflection of the burdens imposed by toxic masculinity and control. This discussion emphasizes the critical importance of consent and agency in relationships, contrasting the oppressive dynamics present in both "Yonec" and ACOTAR with the liberating partnership offered by Rhysand, one of the main male protagonists in ACOTAR. Ultimately, this presentation advocates for the recognition of fantasy literature as a vital medium for exploring themes of identity, freedom, and the complexities of human relationships, underscoring the significance of romantic fantasy in addressing these themes. *Faculty sponsor: Wilson Chen* 

## Amina Raza

"Masks and Hypocrisy: An Intersectional and Environmental Approach to Analyzing Kate Chopin's Work in 'At the Cadian Ball' and 'The Storm'"

This presentation explores Kate Chopin's story "At the 'Cadian Ball" and its sequel, "The Storm," which explore how individuals sacrifice their desires to conform to societal norms. These stories depict two distinct social classes: the Creoles, who view themselves as superior due to their wealth and were a mix of French, Spanish, and African ancestry, and the Acadians, a displaced group who relocated to Louisiana in the 1700s. The Acadians were primarily French-speaking settlers of European and Spanish descent, following in the footsteps of their ancestors and identifying themselves as "Cajuns." However, the Creoles were still wealthier and looked down upon them, which created a social divide. My presentation will explore the personal struggles of characters in these stories, focusing deeply on the profound impact societal constraints had on their marital lives. My approach will be from an intersectional, environmental, and feminist point of view to argue that social class and societal expectations are structures created to divide, control, and oppress individuals. *Faculty sponsor: Wilson Chen* 

# SESSION 2 (1:30-3:00 pm)

# Omar Dandashli

"The Fundamentals, Importance, and Applications of Survival Analysis"

This presentation will focus on survival analysis, which is a field of math responsible for predicting future events. Fundamental components that will be discussed including survival and hazard functions, mean residual life, and models used to interpret survival data. Examples of survival and hazard functions will be given. Models shown in the presentation include the Kaplan-Meier Estimator, Cox PH regression, and log-rank test, each providing different conclusions about the data. Applications of survival analysis regarding insect population and clinical trials will be discussed. The aim of these application examples is to find factors that increase or decrease the likelihood of survival on the participants in the study.

Faculty sponsor: Jeremy Nadolski

# Julia Sakowicz

"Decision Trees: The Branch of Law"

Decision trees are a statistical tool used to model decision-making processes by breaking down complex scenarios into a series of simpler yes-or-no questions. Each question, or node, represents a decision point based on available data and the tree branches out based on the possible outcomes, ultimately reaching a final decision or prediction. In legal cases, decision trees can be invaluable for predicting case outcomes by analyzing different pieces of evidence and their probabilities, such as in high-profile trials like the O.J. Simpson case. Using splitting criteria such as Gini Impurity and Information Gain, decision trees help determine which factors—like DNA evidence or witness testimony—are most crucial in predicting whether a defendant will be found guilty or not guilty. These statistical measures help reduce uncertainty and guide the decision-making process by identifying the most influential variables. By employing decision trees, legal professionals can visually assess the likelihood of various outcomes, improving their ability to evaluate complex cases. The use of decision trees offers a structured, data-driven approach to predicting verdicts and provides a clearer understanding of how various factors contribute to the final judgment. *Faculty sponsor: Jeremy Nadolski* 

# Amber Tramutolo

"Determining Factors that Influence the Interaction between Microplastics and Trace Elements in Long Run Creek, IL"

Microplastics are incredibly pervasive plastic pollutants measuring less than five millimeters in size. Though found virtually everywhere, little is known about the long-term health consequences of microplastics, especially in natural

waters. To fully analyze the broader health implications, it is crucial to first understand the physicochemical characteristics that make microplastics so harmful and the contribution of environmental conditions—namely, the presence of trace elements, which can be harmful in high concentrations and are often adsorbed onto microplastics, and water chemistry. By recording precise solution chemistry, characterizing the microplastics found with fluorescence microscopy, and determining the trace elements present using flame atomic absorption spectroscopy, the most influential factors could be determined. Knowing these influential factors will provide a basic understanding of how microplastics interact with smaller particles in natural waters. This knowledge may serve as a baseline by which the interactions between microplastics and larger particles, such as poly- and per-fluoroalkyl substances, persistent organic pollutants, or other emerging contaminants, might be understood. It was found that the distribution of microplastic forms had an effect on the amount of trace elements, such as manganese, zinc, and iron, adsorbed.

Faculty sponsor: Niina Ronkainen

# SESSION 3 (3:00-4:30 pm)

### Sara Afreen

"Making Decisions Through Principal Component Analysis (PCA)"

Principal Component Analysis (PCA) is a statistical technique that transforms a high-dimensional dataset into a lower-dimensional space by identifying the directions, or principal components, that capture the maximum variance in the data using data centering, covariance matrix multiplication, and eigenvalue decomposition. PCA has become an indispensable tool in fields ranging from genetics and finance to image processing and machine learning. Mathematical foundations of PCA and recent advancements in PCA, such as robust PCA, functional PCA, and nonlinear PCA will be explored. Through a practical example using the Iris dataset, PCA can be applied to reduce dimensionality while retaining critical information.

Faculty sponsor: Jeremy Nadolski

#### Claire Chevalier

"Suicide as a Means to Meaning: A Nietzschean Analysis of Existential Psychology"

Suicide is often framed through a purely clinical lens, attributed to chemical imbalances and psychiatric disorders. However, existentialist philosophy offers an alternative perspective—one that views suicidal ideation as a confrontation with meaninglessness rather than merely a symptom of mental illness. Friedrich Nietzsche's discourse on nihilism and life-affirmation provides a compelling framework for understanding this crisis, particularly through his concepts of eternal recurrence and self-overcoming. Nietzsche suggests that those who experience profound despair are not necessarily doomed to succumb to it but may instead reconstruct meaning through an active process of affirming life. Viktor Frankl's logotherapy expands on this by emphasizing that survival and resilience depend on one's ability to find or create meaning, even in suffering. Similarly, Rollo May's existential psychology posits that suicidal crises often stem from an inability to conceptualize a meaningful future, reinforcing the idea that suicide is not merely a pathological condition but an existential reckoning. Integrating Nietzsche's philosophy with psychological theories from Frankl and May examines suicide as an existential phenomenon—a critical juncture where individuals grapple with despair and the search for meaning, navigating the tension between nihilism and the potential for self-redefinition. This approach challenges reductionist clinical narratives, offering a nuanced understanding of suicide

Faculty sponsor: Steven Burgess

#### Waasif Syed

"Acoustics in Seashells: How Seashell Geometry Affects Sound"

The common phenomenon of hearing the ocean from a seashell pressed up against your ear is a popular myth that can be explained through the properties of sound waves. The seashell's shape, size, and composition act as a natural

resonating chamber that reverberates sound and amplifies it. Exploring the properties of sound inside seashells has many interesting applications since the ocean sound resonating inside the shell could have a positive psychological impact on individuals and can potentially be the basis for a new type of anxiety or stress treatment. Furthermore, understanding how sound in seashells is modified based on the seashell's shape and size could inspire new designs for microphones/speakers and lead to advancements in sound design. We will present the results on the types of sounds/frequencies that a seashell can produce and will demonstrate how the sound changes based on the shell's shape. We will explore the sound measuring techniques and demonstrate the sensitivity of the data collection to the data measuring setup.

Faculty sponsor: Darya Aleinikava