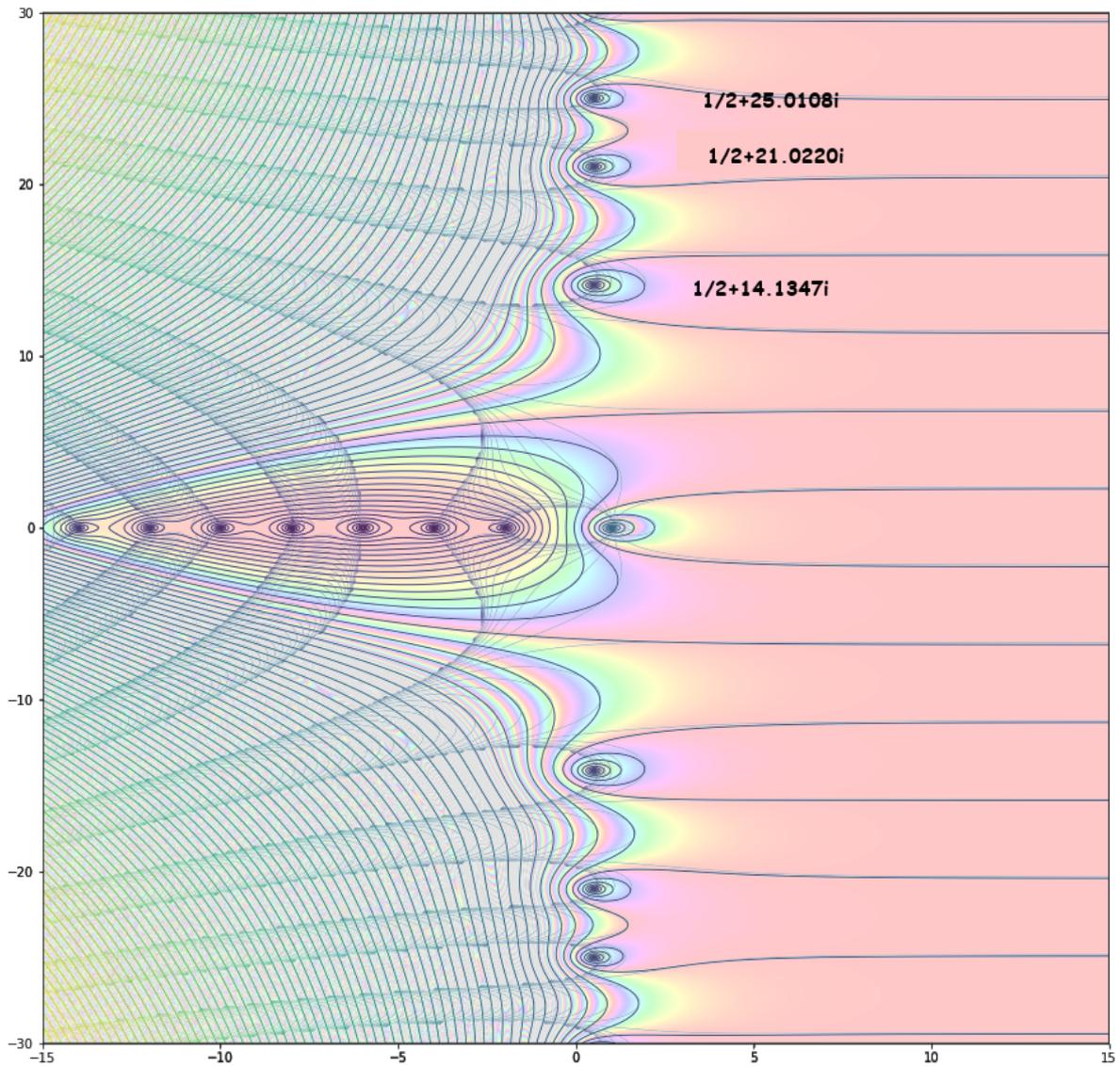




MAA-FL | FTYCMA
Joint Conferences LIX
February 20-21, 2026



Program & Abstracts



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President Jacob Aguilar, Saint Leo University
Past President Chuck Lindsey, Florida Gulf Coast University
Vice-President for Programs Altay Özgener, State College of Florida
Vice-President for Site Selection Ala J. Alnaser, Florida Polytechnic University
Secretary-Treasurer Sidra Van De Car, Valencia College
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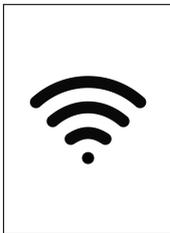
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Kaitlyn Dunn/9-201/9:45-10:05	28
Anne Howell/9-202/9:45-10:05	28
Austin Anderson/9-203/9:45-10:05	28
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Peng Feng/9-219/9:45-10:30	29
David House/9-210/10:00-10:45	29
Tharindu De Alwis/9-212/10:00-10:45	29
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Anne Howell/9-202/10:10-10:30	30
Binod Rimal/9-203/10:10-10:30	30
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Jared Bunn/9-219/10:45-11:05	32
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Pre-Conference Meetings

Committee Meetings

10:00 – 12:00	FL-MAA Executive Committee Meeting	9-112
9:30 – 10:30	FTYCMA Officer’s Meeting	9-114
10:30 – 11:30	FTYCMA Business Meeting	9-114
11:30 – 5:30	Hospitality Room	9-103/104
11:30 – 5:30	Students’ Room-Friday	9-102
8:00 – 11:30	Students’ Room-Saturday	9-102



No password is needed for SCF-Guest Wi-Fi.



No smoking of any kind! Thanks for observing our rules.



Use Parking Lot I, J or H. No need for a parking permit.

Registration Information

Where?

Neel Performing Arts Center
Neel Auditorium

When?

12:00 – 3:00 PM
Neel Performing Arts Center
Neel Auditorium

What about after 3:00 PM?

3:00 – 5:00 PM
Building #9

What about Saturday?

8:30 – 11:00 AM
Building #9

Updates for Saturday, February 21, 2026

We added the following sessions.

Graduate Fair

When and where?

Saturday, February 21, 2026
11:00 – 11:50 AM
Carol F. Probstfeld Library & Learning Center and
Family Heritage House
Community Room

Posters

When and where?

Saturday, February 21, 2026
11:30 – 11:50 AM
Carol F. Probstfeld Library & Learning Center and
Family Heritage House
Community Room

SCF President's Letter



STATE COLLEGE OF FLORIDA, MANATEE-SARASOTA

OFFICE OF THE PRESIDENT

Tommy Gregory, J.D.

February 20, 2026

Dear Conference Attendees,

It is my pleasure to welcome you to State College of Florida, Manatee-Sarasota, and to our Bradenton Campus for the 2026 MAA-FL | FTYCMA Joint Conference. We are honored to host this annual gathering of mathematics educators, scholars, and students from across the state.

This joint conference reflects the spirit of collaboration and lifelong learning that defines our academic community. Your commitment to advancing mathematics education, sharing research, and engaging in professional development serves as an inspiring example for our students and colleagues alike.

I wish you an engaging and productive conference filled with meaningful connections, innovative ideas, and continued success in your work. Thank you for choosing SCF as your host, and best of luck with your presentations and discussions.

Sincerely,

A handwritten signature in blue ink that reads "Tommy Gregory".

Tommy Gregory, J.D.

President

State College of Florida, Manatee-Sarasota

SCF.edu • Mailing Address: P.O. Box 1849, Bradenton, FL 34206 • Office Phone: 941-752-5201

SCF BRADENTON
5840 26th Street West • 941-752-5000

SCF LAKEWOOD RANCH
7131 Professional Parkway • 941-363-7000

SCF VENICE
8000 South Tamiami Trail • 941-408-1300

Welcoming Remarks

The first plenary session and the registration will take place in the Neel Performing Arts Center (Building #11 EAST). So you may want to park Lot H or J. The registration table move to the first floor of Building #9 (our talks will be in there) after 3:05 PM on Friday, February 20, 2026.)

Registration: Building #9 after 3:10 PM on Friday, February 20, 2026.

Opening: Neel Performing Arts Center (Building #11 EAST).

Talks: Building #9

Student Activities/Graduate School Fair: The Community Room, Library Building (Building #3)

1:45 – 2:00

Neel Performing Arts Center
Neel Auditorium

Robert Shollar, Chair, Local Organization Committee

Joni Pirnot, Co-Chair, Local Organization Committee

Tommy Gregory, J.D., President, State College of Florida

Sidra Van De Car, President, FTYCMA

Jacob Aguilar, President, FL-MAA

C. Altay Özgener, Vice-President for Programs

Keynote speaker #1

Richard J. Cleary

*MAA Vice President
Weissman Family Professor of Business Analytics
Babson College*

Sports Applications of Mathematics in the Era of Legalized Gambling



We are now more than twenty years beyond the publication of Michael Lewis' classic book *Moneyball*, which popularized the previously niche subject of sports analytics. Since that time the field has grown and evolved, and now the introduction of legalized wagering on sports has made a generation much more interested in sports applications of mathematics. In this presentation, we will look at some of the key analytics ideas that are now deeply ingrained in sports teams and leagues, and we will demonstrate some 'non-standard' uses of mathematics in sports that are not well known. The example provided can be adapted for teaching at almost any mathematical level.

2:00 – 2:55 PM
Friday, February 20, 2026
Neel Performing Arts Center
Neel Auditorium

Keynote speaker #2

Steve Butler

Iowa State University

Juggling Counts



Mathematics is a language which can help us describe and explore patterns. One source of patterns that mathematicians have been exploring comes from juggling (the tossing of objects, usually balls or clubs). In this talk we will look at multiple ways to describe juggling patterns that allow us to find new juggling patterns, and to count how many possible patterns exist. We can compare answers to various problems to give a combinatorial proof of Worpitzky's identity. We will also look at a few juggling-based problems that mathematics has not yet succeeded in answering.

6:00 – 6:55 PM

Friday, February 20, 2026

Neel Performing Arts Center

Neel Auditorium

Keynote speaker #3

Dennis Runde

*State College of Florida
Retired*

**What I Wish I Knew When I Started:
Ten (or more) Valuable Lessons Learned from
Thirty-Five Years of Teaching Mathematics**



By living through the various life events that are summarized in my biography, I have learned various lessons about teaching mathematics that are still relevant today. My talk will highlight ten of these lessons. The talk will allow attendees to interact and share some of their own lessons as well.

12:00 – 12:55 PM
Saturday, February 21, 2026
Neel Performing Arts Center
Neel Auditorium

A Glance at Student Activities

Here are the planned activities.

Competitions

When and where?

Friday, February 20, 2026

3:00 – 4:50 PM

Carol F. Probstfeld Library & Learning Center and
Family Heritage House
Community Room

Graduate Fair

Friday, February 20, 2026

5:00 – 5:50 PM

Carol F. Probstfeld Library & Learning Center and
Family Heritage House
Community Room

Posters

When and where?

Friday, February 20, 2026

5:00 – 5:50 PM

Carol F. Probstfeld Library & Learning Center and
Family Heritage House
Community Room

Talks/Friday 20, 2026

Vinicius Bilinski/9-201/3:05-3:25

Vinicius Bilinski

UG

Florida Atlantic University

Mathematical approach to Morphing Aerostructures

Matthew Kimm/9-202/3:05-3:25

Matthew Kimm

F

University of West Florida

An Application of Mathematics to Information Systems

Jacci White, Monika Kiss, Abigail Burrows/9-203/3:05-3:25

Jacci White, Monika Kiss, Abigail Burrows

F

Saint Leo University

From Placement to Performance: What We Know and What You Know

Warren McGovern/9-210/3:05-3:25

Warren McGovern

F

Wilkes Honors College, FAU

Modern Algebra - What Next?

Joy D'Andrea/9-212/3:05-3:25

Joy D'Andrea

F

USF

Euler Characteristic Numbers in Reference to Fundamental Transversals

Daniela Genova, et al/9-214/3:05-3:25

Daniela Genova, et al

F

University of North Florida

Undergraduate Mathematics Research and Venues

Anurag Katyal/9-215/3:05-3:50

Anurag Katyal

F

Palm Beach State College

Different Ways of Looking at the Familiar

Ted Andresen/9-218/3:05-3:25

Ted Andresen

P/I

Terms that graduates may encounter during job interview

John Pfeilsticker/9-219/3:05-3:25

John Pfeilsticker

F

Santa Fe College

Some Accessible Problems in the Theory of Partitions

Shelletta Baker/9-216/3:05-3:50

Shelletta Baker

F

Valencia College

Metacognitive Tools for Math Success

Vi Nguyen/9-201/3:30-3:50

Vi Nguyen

F

University of North Florida

Error-Correcting Convolutional Neural Networks I

Dylan Hewlett/9-202/3:30-3:50

Dylan Hewlett

G

University of North Florida

Undecidability and Reducibility: From Diagonalization to Mapping Reductions

Keshav Acharya/9-203/3:30-3:50

Keshav Acharya

F

Embry-Riddle Aeronautical University

Strengthening Study Skills through Problem Based Learning with Student Partner

Douglas Pfeffer/9-210/3:30-3:50

Douglas Pfeffer

University of Tampa

Dimensional Slicing in Euclidean and non-Euclidean Geometries

F

Gregory Goeckel/9-212/3:30-3:50

Gregory Goeckel

Presbyterian College

Sudoku and Unimodular Hypergraphs

F

Michael Brilleslyper/9-214/3:30-3:50

Michael Brilleslyper

Florida Polytechnic University

Rational Approximations to Irrational Square Roots

F

Bernadette Mullins, et al/9-218/3:30-3:50

Bernadette Mullins, et al

Florida Polytechnic University

Can Exam Reflections Improve Student Learning?

F

Claire Geiger, C. Altay Özgener/9-219/3:30-3:50

Claire Geiger, C. Altay Özgener

F

State College of Florida

A Genius in Action, Bernhard Riemann

Vi Nguyen/9-201/4:00-4:20

Vi Nguyen

F

University of North Florida

Error-Correcting Convolutional Neural Networks II

Deepak Bastola/9-202/4:00-4:20

Deepak Bastola

G

Florida Atlantic University

Identifying Hidden Crime Patterns in Chicago Neighborhoods Using Hidden Markov Models

Tamara Johns/9-203/4:00-4:20

Tamara Johns

F

Palm Beach State College

So . . . Where's the Math?

Michael Schroeder/9-212/4:00-4:20

Michael Schroeder

F

Stetson University

Correspondences Between Tournaments, Permutations, and ASMs

Sami M. Hamid/9-214/4:00-4:20

Sami M. Hamid

F

University of North Florida

Convergence Analysis of Ishikawa Iterations via Regular Matrices

Scott Hochwald/9-216/4:00-4:45

Scott Hochwald

F

University of North Florida

Probability Tales From the Harmonic Series

Kelie Kan/9-218/4:00-4:20

Kelie Kan

F

University of West Florida

Explainable AI Using SHAP: Anomaly Detection in Cybersecurity Using Isolation Forest

Jaffar Ali Shahul Hameed/9-219/4:00-4:20

Jaffar Ali Shahul Hameed

F

Florida Gulf Coast University

AI for Teaching, Learning, and Assessment in Mathematics

FTYCMA/9-215/4:00-4:45

FTYCMA

Active Learning in MGF X130/31 and STA X023

Reese Gomez/9-201/4:25-4:45

Reese Gomez

UG

Florida Atlantic University

Exploring Dynamics of Large Neural Networks

Dennis Perusse/9-202/4:25-4:45

Dennis Perusse

G

University of North Florida

3D Printing for Math Projects and Manipulatives

Jay Sparks/9-203/4:25-4:45

Jay Sparks

F

University of West Florida

Predicting Graduation Timelines Based on Course and Program Factors

AJ Alnaser/9-210/4:25-4:45

AJ Alnaser

F

Florida Polytechnic University

A Mathematician's Point of View on Autonomous Vehicles

Bernhard Klingenberg/9-212/4:25-4:45

Bernhard Klingenberg

F

New College Florida

What Does a Master's in Applied Data Science Look Like?

Joseph Ours/9-218/4:25-4:45

Joseph Ours

F

State College of Florida

Increasing Mathematical Processes

Aaron Warnock/9-214/5:00-5:50

Aaron Warnock

P/I

College Algebra and Beyond: Tools to Personalize and Apply Conceptual Understanding

FTYCMA/9-215/5:00-5:50

FTYCMA

Reverse Engineering MGF X130/31 and STA X023

Chuck Lindsey/9-216/5:00-5:50

Chuck Lindsey

F

Florida Gulf Coast University

News and Updates from the MAA

Keynote speaker #2

Steve Butler

Iowa State University

Juggling Counts



Mathematics is a language which can help us describe and explore patterns. One source of patterns that mathematicians have been exploring comes from juggling (the tossing of objects, usually balls or clubs). In this talk we will look at multiple ways to describe juggling patterns that allow us to find new juggling patterns, and to count how many possible patterns exist. We can compare answers to various problems to give a combinatorial proof of Worpitzky's identity. We will also look at a few juggling-based problems that mathematics has not yet succeeded in answering.

6:00 – 6:55 PM

Friday, February 20, 2026

Neel Performing Arts Center

Neel Auditorium

Banquet

Where?

Dining Hall
Wilson F. Wetzler Student Union
Building #14

When?

7:10 – 8:30 PM

Talks/Saturday 21, 2026

Audrey Eley/9-201/8:45-9:05

Audrey Eley

G

Florida Institute of Technology

Evaluating Synthetic Data Augmentation Methods in Radiomics-Based Lung Staging

Furio Gerwitz/9-202/8:45-9:05

Furio Gerwitz

UG

University of North Florida

Error Correcting Codes

Brian Curtin/9-203/8:45-9:05

Brian Curtin

F

University of South Florida

Bitrades for cooperative pairs

Fernanda Rocha Miranda/9-211/8:45-9:05

Fernanda Rocha Miranda

G

Florida Institute of Technology

Distributional Survival Analysis and Risk Stratification in Lung Cancer

Brandon Cribbs/9-218/8:45-9:05

Brandon Cribbs

G

University of North Florida
Reed-Solomon Error-Correcting Codes

Stephen Jennings/9-219/8:45-9:30

Stephen Jennings

P/I

MathGPT.ai
MathGPT.ai: An AI-Powered Platform Built for Math

Robin Zide/9-210/9:00-9:45

Robin Zide

F

Indian River State College
Equations of the Mind: Linking Algebra, Psychology, and Authentic Life for Student Wellness

Anurag Katyal/9-215/9:00-10:45

Anurag Katyal

F

Palm Beach State College
Creating AI-Resistant Interactive Activities to Facilitate Active Learning

Bernhard Klingenberg/9-216/9:00-10:45

Bernhard Klingenberg

F

New College Florida

Mobile Apps for Stats & Data Science Education

Calvin Rose/9-201/9:10-9:30

Calvin Rose

UG

Eckerd College

Creating a Model for Mangrove Population Dynamics with Python Script

Furio Gerwitz /9-202/9:10-9:30

Furio Gerwitz

UG

University of North Florida

The Chromatic Number and Its Bounds

Angela Angeleska/9-203/9:10-9:30

Angela Angeleska

F

The University of Tampa

Balanced Complexes in Metabolic Networks

Christian Corbett/9-218/9:10-9:30

Christian Corbett

G

Florida Atlantic University

Nuclei and d -elements in algebraic frames without FIP

Kaitlyn Dunn/9-201/9:45-10:05

Kaitlyn Dunn

UG

Florida Institute of Technology

Spectral Clustering of Survival-Radiomic Graphs Reveals Hidden Structure in Lung Cancer

Anne Howell/9-202/9:45-10:05

Anne Howell

UG

University of North Florida

Ramsey Theory for Finite Graphs: Complete disorder is impossible

Austin Anderson/9-203/9:45-10:05

Austin Anderson

F

Florida Polytechnic University

Extremal Combinatorics with Sums of Squares

Andrew Murphy/9-211/9:45-10:05

Andrew Murphy

UG

Embry-Riddle Aeronautical University

Principal Component Analysis Applications for Wide-Field-of-View Lenses

Donald McGinn/9-218/9:45-10:05

Donald McGinn

F

University of West Florida

Prime Producing Polynomials, Pell-type Equations, and the Near-square Prime Conjecture

Peng Feng/9-219/9:45-10:30

Peng Feng

F

Florida Gulf Coast University

Boundedness, Stability and Turing Patterns in a Quasilinear Three-species Model With Prey-taxis and Predator-repulsion

David House/9-210/10:00-10:45

David House

F

University of North Florida

Calculus as the Engine of Large Language Models

Tharindu De Alwis/9-212/10:00-10:45

Tharindu De Alwis

F

University of West Florida

A Unified Envelope Framework for High-Dimensional Matrix-Valued Time Series

Jonathan Bartik/9-201/10:10-10:30

Jonathan Bartik

UG

University of North Florida

A Mathematical Model for Coupled Rocket Trajectory and Passive Stability

Anne Howell/9-202/10:10-10:30

Anne Howell

UG

University of North Florida

Frucht's Theorem

Binod Rimal/9-203/10:10-10:30

Binod Rimal

F

University of Tampa

Neural Signatures of Meditation Expertise: EEG-Based Unsupervised Modeling

Ken Mulzet/9-211/10:10-10:30

Ken Mulzet

F

Florida State College at Jacksonville

Pythagorean Quadruples (and beyond!)

Mohamed Jaber/9-218/10:10-10:30

Mohamed Jaber

F

Florida Institute of Technology

Interpretable Radiomics for Survival Prediction in Non-Small Cell Lung Cancer

Jay Nulph/9-201/10:45-11:05

Jay Nulph

G

University of Central Florida

Spatial Autoregression Model: Dependent Errors

Raymond Clines/9-202/10:45-11:05

Raymond Clines

UG

University of North Florida

Generalizing Pascal's Triangle

Mariya Ivanova/9-203/10:45-11:05

Mariya Ivanova

F

University of Tampa

Teaching Smarter, Not Harder - 10 Practical Ways AI Can Transform the Classroom

Hemanta Kunwar/9-218/10:45-11:05

Hemanta Kunwar

F

Embry-Riddle Aeronautical University

Global-Local Method for Poroelasticity Problems with Localized Pressure Effects

Jared Bunn/9-219/10:45-11:05

Jared Bunn

F

Florida Polytechnic University

The Putnam at Florida Poly – My Experience

Gayathri Krishnan/9-219/11:10-11:55

Gayathri Krishnan

F

University of Central Florida

Self Advection of a Thin Vortex Filament in Incompressible Fluid

James Young/9-212/11:00-11:20

James Young

UG

Florida Polytechnic University

Integer Factorizations and Exact Zero-Divisor Graphs of the Integers Modulo n

Hayden Tyler/9-201/11:10-11:30

Hayden Tyler

UG

University of North Florida

p -adic Numbers and the Hasse Principle

Raymond Clines/9-202/11:10-11:30

Raymond Clines

UG

University of North Florida

An Introduction to the Mathematics of Juggling

Erin Griesenauer/9-203/11:10-11:30

Erin Griesenauer

F

Eckerd College

Leveraging Trauma-Informed Pedagogy to Support Students Through a Hurricane

Cindy Ceijas/9-211/11:35-11:55

Cindy Ceijas

UG

Florida Polytechnic University

Combinatorial Approach to Course Scheduling at Florida Polytechnic

Ranadeep Daw/9-212/11:35-11:55

Ranadeep Daw

F

University of West Florida

Causal Effects of Urban Amenities on airbnb Prices: A Hybrid Spatial Filtering Approach

Keynote speaker #3

Dennis Runde

*State College of Florida
Retired*

**What I Wish I Knew When I Started:
Ten (or more) Valuable Lessons Learned from
Thirty-Five Years of Teaching Mathematics**



By living through the various life events that are summarized in my biography, I have learned various lessons about teaching mathematics that are still relevant today. My talk will highlight ten of these lessons. The talk will allow attendees to interact and share some of their own lessons as well.

12:00 – 12:55 PM
Saturday, February 21, 2026
Neel Performing Arts Center
Neel Auditorium

Student Events

Where?

We will be using *the Community Room* on the southeast side of the Building 3, the Carol F. Probstfeld Library & Learning Center and Family Heritage House. Right across from the Neel Performing Arts Center.

When?

Friday, February 20, 2026
3:00 – 4:50 PM

Student Integration Contest 3:00 – 3:50

Put your integration skills to the test! This 50-minute competition will feature integration problems requiring a variety of calculus techniques. Calculators and notes are not allowed. Undergraduate students of any background are welcome to participate, and the top three scores will receive Amazon Gift Cards in addition to being recognized for their achievement.

Student Problem-Solving Contest 4:00 – 4:50

Put your reasoning skills to the test! This 50-minute competition will feature a variety of fun problems spanning the gamut of the field of mathematics. Calculators and notes are not allowed. Undergraduate students of any background are welcome to participate, and the top three scores will receive Amazon Gift Cards in addition to being recognized for the achievement.

Closing Remarks/Luncheon/Business Meeting

Where?

Neel Performing Arts Center
Neel Auditorium
&
Wilson F. Wetzler Student Union
Building #14

When?

1:10 – 3:00 PM

Sidra Van De Car, President, FTYCMA

Jacob Aguilar, President, FL-MAA

Luncheon, Award Ceremony and FL-MAA Business Meeting

Vinicius Bilinski

UG

Florida Atlantic University

Mathematical approach to Morphing Aerostructures

Modern aerospace engineering is transforming transportation through shape-shifting materials and biomimetic designs that improve fuel efficiency and reduce noise. This innovation presents a fundamental mathematical challenge: a wing must be rigid enough to carry aerodynamic loads yet flexible enough to change shape. We explore initial approaches to this “stiffness–compliance conflict” by modeling a wing’s internal skeleton as a mathematical graph, where edges represent struts and vertices represent joints. Our long-term goal is to analyze how lattice connectivity drives the transition from rigid structures to movable mechanisms and to develop a Python simulation for designing adaptive aerostructures.

Jacci White, Monika Kiss, Abigail Burrows

F

Saint Leo University

From Placement to Performance: What We Know and What You Know

Effective mathematics placement is critical for student success in introductory and advanced courses. This session will explore what works in placement strategies, including assessment tools, advising practices, and data-driven approaches. We will examine evidence on how accurate placement correlates with performance and persistence in subsequent mathematics courses. Participants will gain insights into best practices and common challenges, and have an opportunity to share their own experiences and solutions. Join us for an interactive discussion aimed at improving placement processes and fostering student achievement in mathematics programs.

Ted Andresen

P/I

Terms that graduates may encounter during job interview

This presentation for cover topic and terms that a graduate may encounter during interview process.

John Pfeilsticker

F

Santa Fe College

Some Accessible Problems in the Theory of Partitions

The theory of integer partitions and their associated generating functions impact research areas from combinatorics and computer science to the study of modular forms. This talk aims to introduce the listener to the duality between hypergeometric series identities and bijective combinatorial arguments for enumerating integer partitions, demonstrate a few well known examples, and tempt new developments by presenting a few surprisingly accessible open problems.

Vi Nguyen

F

University of North Florida

Error-Correcting Convolutional Neural Networks I

This project demonstrates how coding theory can enhance the accuracy and robustness of Convolutional Neural Networks in image recognition. The approach aims to reduce classification errors and improves the model's resilience to noise and mislabeling. The findings highlight the potential of combining deep learning with coding theory.

Undecidability and Reducibility: From Diagonalization to Mapping Reductions

Computability theory can be used to demonstrate that certain problems cannot be solved by any algorithm. After recalling Turing machines and the Church–Turing Thesis, we present the acceptance problem as a central example and prove its undecidability using a diagonalization argument. Mapping reducibility is then discussed as a method for transferring undecidability from one problem to many others. The talk concludes with a discussion of Rice’s Theorem, which shows that every nontrivial property of a Turing machine’s language is undecidable, illustrating broad limits on automated program analysis.

Strengthening Study Skills through Problem Based Learning with Student Partner

This study investigates the effectiveness of Problem-Based Learning (PBL) combined with a Student Partner (SP) model in strengthening students' study skills in a Calculus III class. The PBL activities were integrated with traditional lecture-based instruction rather than replacing it. A senior undergraduate student helped develop application-based problems drawn specifically from aerospace engineering courses, enabling students to connect calculus concepts with disciplinary applications. The student partner also supported learning through peer mentoring and collaborative facilitation. Data from surveys, reflections, and classroom observations indicate improvements in students' time management, motivation, conceptual understanding, and problem-solving abilities. The results suggest that combining traditional lectures with PBL and a student partner model enhances active learning and strengthens core study skills in Calculus III.

Bernadette Mullins, et al

F

Florida Polytechnic University

Can Exam Reflections Improve Student Learning?

In an effort to enhance student learning, reduce DWF rates, and better understand how students perceive reflective assessment practices, instructors in Precalculus, Calculus I, and Calculus II required students to complete exam reflections and corrections. We administered a survey ($n = 314$) to examine students' perceptions of the extent to which this practice supported their learning and other instructional components, including active learning, group work, quizzes, homework formats, and the use of AI tools. We summarize the key findings and discuss potential implications for instructional and assessment design. Future work will investigate themes in students' written reflections and corrections.

Claire Geiger, C. Altay Özgener

F

State College of Florida

A Genius in Action, Bernhard Riemann

This year is the 200th birth anniversary of a great German mathematician Georg Friedrich Bernhard Riemann. We will present a cross-section of his life, family, education, and his contributions to mathematics and physics.

Vi Nguyen

F

University of North Florida

Error-Correcting Convolutional Neural Networks II

This project demonstrates how coding theory can enhance the accuracy and robustness of Convolutional Neural Networks in image recognition. The approach aims to reduce classification errors and improves the model's resilience to noise and mislabeling. The findings highlight the potential of combining deep learning with coding theory.

Deepak Bastola

G

Florida Atlantic University

Identifying Hidden Crime Patterns in Chicago Neighborhoods Using Hidden Markov Models

Urban crime exhibits temporal patterns that suggest underlying hidden states of neighborhood safety. This study applies Hidden Markov Models to Chicago crime data (2001-2025) to identify and predict latent crime regimes across different neighborhoods. We model safety as a discrete-state process where hidden states (Low Risk, Medium Risk, High Risk) emit observable crime events. Using the Viterbi algorithm, we decode state sequences and compare transition dynamics across neighborhoods. Our analysis reveals that high-crime areas exhibit more frequent state transitions and shorter persistence in low-risk states. HMM-based predictions outperform baseline methods for week-ahead forecasting. This research demonstrates HMMs' practical utility for evidence-based policing and urban safety planning.

Palm Beach State College

So . . . Where's the Math?

Students in remedial mathematics courses such as Intermediate Algebra often struggle with foundational topics, including integer operations and order of operations, limiting their readiness for more advanced coursework. To support concept review and skill rebuilding, a game-based instructional model was implemented during Math Jumpstart, a weeklong mathematics boot camp for students entering Intermediate and College Algebra. The activities focused on strengthening number sense and reactivating prior knowledge in a low-stakes, engaging environment. Preliminary observations indicate that interactive mathematical games can improve student confidence and procedural fluency with essential pre-algebraic concepts.

Explainable AI Using SHAP: Anomaly Detection in Cybersecurity Using Isolation Forest

This study explores the use of an unsupervised Isolation Forest model for cybersecurity anomaly detection, incorporating SHAP (SHapley Additive exPlanations) to improve interpretability. The model was trained solely on benign network traffic from multiple UWF Zeek datasets to establish a baseline of normal behavior and detect malicious activity mapped to the MITRE ATT&CK framework. Scalable analysis was achieved through a distributed PySpark implementation applied to millions of network flow records. Feature engineering included temporal, volumetric, and protocol-level characteristics, while precision-recall optimization was used to determine effective anomaly thresholds. The proposed approach demonstrated strong performance across datasets, with F1 scores exceeding 0.95 and AUC values above 0.97, and provided meaningful explanations of anomaly-driving features.

Jaffar Ali Shahul Hameed

F

Florida Gulf Coast University

AI for Teaching, Learning, and Assessment in Mathematics

The integration of generative AI tools into education is quickly changing how we teach and learn, especially in mathematics, a subject often seen as strict and assessment-focused. In this talk, we examine how platforms like QGenAI and similar generative tools are transforming mathematical teaching by enabling educators to create teaching materials, personalized assessments, and learning resources directly from their own content. These tools not only assist educators but also encourage pedagogical flexibility, allowing for rapid adaptation to different learning needs and styles.

Reese Gomez

UG

Florida Atlantic University

Exploring Dynamics of Large Neural Networks

A neural network (NN) can be viewed as a universal function approximator mapping $\mathbb{R}^m \rightarrow \mathbb{R}^n$. Its output is obtained through compositions of linear functionals applied to an input vector, with each functional corresponding to a hidden layer. This presentation introduces the compositional representation of neural networks, outlines the gradient descent method for training, and explores the limiting dynamics of networks as width and depth approach infinity.

Dennis Perusse

G

University of North Florida

3D Printing for Math Projects and Manipulatives

This talk will show examples of 3D designs and projects using the OpenSCAD 3D modeling programming language. This includes a truth table board game, inverse function and derivative manipulatives to see and feel the operations.

Predicting Graduation Timelines Based on Course and Program Factors

Timely graduation is synonymous with student success and institutional effectiveness in higher education. Prior research has primarily focused on the prediction of graduation as a binary problem, classifying students as either on-time or delayed, which limits insight into variation in academic progression. This study reframes graduation as a continuous process by predicting the total number of semesters to degree completion. Using longitudinal student-level administrative data, key predictors of graduation timing are constructed, including cumulative university credit hours, accumulated course failures and withdrawals (DWF hours), cumulative GPA, program on-time rate based on entry major, and a course impact score capturing course sequencing effects. Multiple linear regression is employed as an interpretable baseline model, while Random Forest and XGBoost are applied to model nonlinear relationships and interaction effects. Findings demonstrate that other machine learning approaches outperform linear regression in estimating graduation timelines, indicating the presence of nonlinear academic progression dynamics.

Joseph Ours

F

State College of Florida

Increasing Mathematical Processes

This talk presents the development and initial validation of the Increasing Mathematical Processes: Opportunities for Vital Engagement (IMPrOVE) instrument, designed to provide instructors practical guidance for developing students' mathematical processes. These processes include problem solving, reasoning and proof, communication, connections, and representation and are the habits of mind of successful mathematicians. Instrument development occurred across three phases: item development, expert review and cognitive interviews, and pretesting. Evidence supported validity based on content, response processes, and related variables.

Ken Mulzet

F

Florida State College at Jacksonville

Pythagorean Quadruples (and beyond!)

*A **Pythagorean triple** is defined to be a set of positive integers (a, b, c) that solves the Pythagorean equation $a^2 + b^2 = c^2$. We define a **Pythagorean quadruple** to be a set of positive integers (a, b, c, d) that solves the equation $a^2 + b^2 + c^2 = d^2$. In this talk, I will present various methods for finding Pythagorean triples and Pythagorean quadruples, as well as similar equations. This will be a fun and interactive talk, so be sure to bring pencil and paper!*

Warren McGovern

F

Wilkes Honors College, FAU

Modern Algebra - What Next?

Most math majors take a semester of Modern Algebra. The talk will be centered on what kinds of things could come next. Focus will be on Ring Theory.

Joy D'Andrea

F

USF

Euler Characteristic Numbers in Reference to Fundamental Transversals

In this talk, we will discuss the extension of Euler's Polyhedron Theorem applied to fundamental transversals. Fundamental Transversals are unions of connected orbits that are intersected exactly once. We will be focusing on convex polyhedra in this talk. The extension idea allows a deeper look into the topological invariants of the polyhedra's fundamental transversals.

Undergraduate Mathematics Research and Venues

Advising undergraduate research is not an easy task. Even when a student's journey is successful, there are many challenges ahead. Students need recognition for their hard work and finding the appropriate venues to present their research can be challenging. Applying for funding presents yet additional hurdles. In this talk, we outline the motivation, successes and challenges in envisioning, starting, and running a successful undergraduate mathematics conference. We hope our presentation encourages faculty to start their own undergraduate conference at their institution. Students will learn about the advantages of engaging in research early and how to navigate funding and recognition.

Anurag Katyal

F

Palm Beach State College

Different Ways of Looking at the Familiar

Over the past several years, I've noticed my intermediate algebra students making many of the same recurring mistakes. For my sabbatical project, I set out to examine familiar topics from fresh perspectives in hopes of reenergizing student learning. This work led to a set of meaningfully effective activities that invite students to take a constructivist approach to exploring mathematical relationships, while transforming traditional worksheets into interactive puzzles and games that students are genuinely excited to solve. In this talk, I will showcase several of these activities and offer the audience opportunities to experience some of the more hands-on problems themselves.

Shelletta Baker

F

Valencia College

Metacognitive Tools for Math Success

Are students prepared for exams? This faculty-driven discussion introduces structured transferrable strategies to build students' metacognitive skills in mathematics courses. During the session Dr. Baker will model approaches designed to help Liberal Arts Mathematics,

Douglas Pfeffer

F

University of Tampa

Dimensional Slicing in Euclidean and non-Euclidean Geometries

In 1901, Schläfli established that the number of dimension- k regions that result when \mathbb{R}^k is sliced by n dimension- $(k - 1)$ hyperplanes in general position is equal to $\sum_{i=0}^k \binom{n}{i}$. We generalize this result to count the number of dimension- j objects that result from this slicing for $0 \leq j \leq k$. We then establish analogous results for spherical and hyperbolic geometries.

Matthew Kimm

F

University of West Florida

An Application of Mathematics to Information Systems

In this talk, we pose an advanced search capability problem and consider a collaborative editing problem as an extension. For the advanced search capability problem, we solve a constraint satisfaction problem by finding a perfect matching on a bipartite graph. For the collaborative editing problem, we discuss techniques used for collaborative editing.

AJ Alnaser

F

Florida Polytechnic University

A Mathematician's Point of View on Autonomous Vehicles

In this talk, we pose an advanced search capability problem and consider a collaborative editing problem as an extension. For the advanced search capability problem, we solve a constraint satisfaction problem by finding a perfect matching on a bipartite graph. For the collaborative editing problem, we discuss techniques used for collaborative editing.

Gregory Goeckel

F

Presbyterian College

Sudoku and Unimodular Hypergraphs

In this paper, I explore the properties of unimodular hypergraphs and hypergraphs with a full set of dispersion free states. From these hypergraphs, I provide a property of bistochastic matrices that can be applied to a solved sudoku puzzle.

Michael Schroeder

F

Stetson University

Correspondences Between Tournaments, Permutations, and ASMs

The xray of a permutation is a list of sums of all possible inputs with their outputs. A score sequence is a list of the number of wins that a set of teams achieve in a round-robin tournament. These seemingly unrelated objects have a surprising correspondence that was conjectured in 2005 that still remains unproven. In this talk, we discuss the suspected correspondence between these objects, review a more recent conjecture on the topic that was proved to be false, and walk through a recent revelation that relates these objects to alternating sign matrices.

Bernhard Klingenberg

F

New College Florida

What Does a Master's in Applied Data Science Look Like?

What is Data Science and what do data scientists do? What tools are they using? Learn about Data Science in general and about the structure of the Applied Data Science master's program at New College Florida in particular. I will present recent student projects ranging from solar flare identification to pistachio crop pest management. I'll also discuss the necessary mathematical and computational background required to enter a master's program.

Michael Brilleslyper

F

Florida Polytechnic University

Rational Approximations to Irrational Square Roots

Finding sequences of rational numbers that approximate irrational square roots is an old and rich topic. In this talk, we explain how an unrelated question concerning the Fibonacci sequence (and some of its closely related cousins) led to an unexpected rediscovery of famous rational approximations to certain irrational square roots. While the results are not new, the way in which they came about demonstrates the value of simply playing around with well-known mathematical topics and finding unexpected connections. The topic is well-suited to an undergraduate project.

Sami M. Hamid

F

University of North Florida

Convergence Analysis of Ishikawa Iterations via Regular Matrices

This talk analyzes Ishikawa iterations using A -statistical convergence induced by non-negative regular matrices. For continuous mappings on closed, convex, bounded subsets of Banach spaces, under appropriate conditions on the parameters, A -statistical convergence of one iteration sequence implies both iteration sequences converge to the same fixed point.

FTYCMA

Active Learning in MGF X130/31 and STA X023

This session is open to all conference participants and will focus on active learning in MGF X130/31, and STA X023. Join us for an introduction to some active learning strategies, aligned with the content of MGF 1130/31 and STA 2023, that can immediately be used in these courses.

Aaron Warnock

P/I

Pearson

College Algebra and Beyond: Tools to Personalize and Apply Conceptual Understanding

This session is open to all conference participants and will focus on the content, assessment, tasks, tools, and technology used in MGF X130/31 and STA X023. Join us for an interactive session where we take a deep dive into how tasks, tools, and technology, interface with content and assessment in these courses.

FTYCMA

Reverse Engineering MGF X130/31 and STA X023

This session is open to all conference participants and will focus on the content, assessment, tasks, tools, and technology used in MGF X130/31 and STA X023. Join us for an interactive session where we take a deep dive into how tasks, tools, and technology, interface with content and assessment in these courses.

Probability Tales From the Harmonic Series

Matrix-valued data is commonly collected over time in many scientific fields. However, existing methods for handling such data are limited and often suffer from overparameterization. In response, Chen, Xiao, and Yang introduced the matrix autoregressive (MAR) model as an alternative to traditional time series analysis, which relies on vectorization and vector autoregression frameworks. By preserving the original structure of matrices, the MAR model avoids the loss of valuable column and row information. This approach offers a significant reduction in dimensions and enables explicit interpretations of the data. However, when applied to high-dimensional matrix time series, the MAR model faces challenges due to the large size of the coefficient matrices involved. It struggles to differentiate between relevant and irrelevant information, making it inefficient in extracting relevant information from complex data. To address these limitations, we propose envelope-based MAR (EMAR) models that effectively identify and eliminate irrelevant information. Our proposed EMAR approach achieves substantial efficiency gains in estimation and forecasting by reducing parameters and constructing a link between the mean function and covariance structure. This is achieved by using minimally reducing subspaces of covariance matrices. We establish the asymptotic properties of our proposed estimators and compare their efficiency and accuracy to existing methods through simulation studies under both normality and non-normality conditions. Furthermore, we provide two real-world applications in economics and business to demonstrate the effectiveness of our approach.

Audrey Eley

G

Florida Institute of Technology

Evaluating Synthetic Data Augmentation Methods in Radiomics-Based Lung Staging

This study compares Bootstrap resampling and SMOTE for data augmentation for imbalanced medical data where Lung1 cancer dataset was used for case study and classification of cancer stage was performed using XGBoost. Post-hoc analyses examined majority voting across models, error overlap, and misclassification patterns using 100 Monte Carlo train-test splits. Synthetic radiomics data generated via SMOTE were visualized and assessed for randomness and feature fidelity across multiple runs. While SMOTE produced sufficiently random datasets similar to the original distribution, Bootstrap augmentation consistently yielded greater model-stability and slightly superior performance. These results suggest resampling-based-augmentation may better justify synthetic-generation for clinical-radiomics.

Furio Gerwitz

UG

University of North Florida

Error Correcting Codes

Error correcting codes are structures which recover transmitted messages even in the case of errors, provided the number of errors remains within a threshold. We introduce error correcting codes, describe perfect error correcting codes and linear codes, and discuss their properties. Finally, we introduce binary and ternary Golay codes, verify they are perfect error-correcting codes, and note their prominent usage in the Voyager missions.

Brian Curtin

F

University of South Florida

Bitrades for cooperative pairs

Borrowing from the theory of Latin bitrades, we develop a corresponding theory for a generalization of a Latin square dubbed a cooperative pair. A cooperative pair consists of a column Latin matrix and a row Latin matrix such that every possible pair of entries appears exactly once in some position. Roughly speaking, the first part of the bitrade is a substructure that can be excised from a cooperative pair and a second part can be substituted to preserve the cooperative pair property. We shall survey a few of our results and offer some examples.

Fernanda Rocha Miranda

G

Florida Institute of Technology

Distributional Survival Analysis and Risk Stratification in Lung Cancer

This study examines overall survival in a cohort of lung cancer patients using classical survival analysis methods. Data from 398 patients were analyzed, with overall survival defined as time from baseline assessment to death, and right-censoring applied for incomplete.

Brandon Cribbs

G

University of North Florida

Reed-Solomon Error-Correcting Codes

Unlike Hamming Codes which correct data one bit at a time, Reed and Solomon proposed an algorithm that corrects multiple bits at a time. The Reed-Solomon Codes, introduced in 1960, are based on Galois Fields, Cyclic Groups, Language Automata and Coding Theory. These codes impacted multiple industries such as space telecommunication.

Stephen Jennings

F

MathGPT.ai

MathGPT.ai: An AI-Powered Platform Built for Math

Learn how MathGPT.ai provides curriculum-aligned, instructor-led AI tutoring that is accurate, cheat-proof, and infinitely patient-built within a complete course and assignment management system. This session will highlight how MathGPT.ai supports student understanding, reduces math anxiety, and maintains academic integrity while offering an affordable solution for departments. Faculty will also learn how to explore the platform and participate in Summer or Fall 2026 pilots.

Creating a Model for Mangrove Population Dynamics with Python Script

Within ecology, given the rise in sea levels and the subsequent intrusion of salt water, it is important to see how mangroves respond to these environmental changes and stressors. Invasive species can also encroach on natural mangrove habitats causing them to behave irregularly. After the introduction of Brazilian Peppertrees (BP) into Florida in the 1950s, the mangrove population has suffered critical losses. So far there has not been a publicly available computer model to try and represent mangrove populations, with or without invasive species like the Brazilian Peppertree. This project seeks to create models that accurately represents mangrove population dynamics with the possibility of rule changes for mangroves in different regions and climates. The research project culminated in two python based 2D cellular automata that took into account salinity, survivability, birth rates, aging, storm events, and species interaction. These parameters can be modified to emulate mangroves in different regions and climates, changing the resulting behavior of the species in the model. One model simulates mangrove dynamics in an island setting while the other simulates dynamics for a coastline ecosystem. This project has potential for new editions to the original code, improving the accuracy of the model. Improvements could include fluctuating species' survival, growth, and chance of death based on age or salt table changes due to hurricanes. With python, these additions can add a new layer of complexity to more accurately model how real mangroves behave in the wild.

The Chromatic Number and Its Bounds

A proper vertex coloring of a simple graph assigns colors to the vertices such that no adjacent vertices share the same color. The chromatic number of a graph is the minimum number of colors for which such a coloring exists. The chromatic number is a fundamental characteristic of a graph, related to the NP-Complete k -colorability problem, with numerous applications in computing and optimization. This presentation discusses bounds for the chromatic number, including Brook's theorem for an upper bound and clique-based theorems for lower bounds, ultimately providing insight into the relationship between graph properties, colorings, and the chromatic number.

Balanced Complexes in Metabolic Networks

The talk presents an analysis of metabolic networks from structural perspective. A metabolic network can be viewed as a directed graph with vertices denoting complexes (of reactants) and edges representing reactions. In addition, the reaction fluxes within a network can be represented by edge weights (functions) in the graph. If N is the stoichiometric matrix of the metabolic network, then the reaction fluxes are vectors v with the property $vN = 0$ when the network is in a steady state. Next, we study multi-reaction dependences over the set of steady states and how they affect balancing in specific areas of a metabolic network, defined by the complexes of the network. In particular, we look at the effect of balanced complexes, concordant complexes and forcedly balanced complexes including their relationship to each other. The study utilizes matrix theory and linear programming.

Nuclei and d -elements in algebraic frames without FIP

A frame is algebraic if each element is the supremum of the compacts below it. Algebraic frames have been studied extensively, often with the additional criterion that the compact elements possess the finite intersection property (FIP). In this talk, we will explore classes of algebraic frames without FIP. In particular, we will investigate inductive closure operators, focusing on the d -operator, and its corresponding fixed points (the d -elements). Without FIP, some familiar properties like nuclearity can fail.

Florida Gulf Coast University

Boundedness, Stability and Turing Patterns in a Quasilinear Three-species Model With Prey-taxis and Predator-repulsion

This study provides a rigorous mathematical analysis of a quasilinear reaction-diffusion system modeling a one-prey, two-predator ecosystem subject to attractive prey-taxis and mutual predator-repulsion. The primary results include establishing global existence and uniform boundedness of classical solutions for spatial dimensions $d \leq 2$ by deriving uniform-in-time a priori estimates based on energy methods, maximal regularity, and a bootstrapping procedure. The study employs Lyapunov functional analysis to derive sufficient conditions for the global asymptotic stability of both the prey-only equilibrium and the interior coexistence equilibrium. Crucially, Turing instability analysis demonstrates that the sole mechanism of predator-predator repulsion can induce diffusion-driven instability in the system, leading to the formation of non-constant positive steady states characterized by spatial segregation and anti-phase patterns in the competing predator densities, thereby acting as a mechanism for predator coexistence. Numerical simulations are also carried out to complement the theoretical results.

Kaitlyn Dunn

UG

Florida Institute of Technology

Spectral Clustering of Survival–Radiomic Graphs Reveals Hidden Structure in Lung Cancer

Prognosis in lung cancer varies substantially among patients with the same TNM stage, indicating limitations of purely anatomical staging. We construct a survival–similarity graph integrating CT-derived radiomic features with survival time to uncover latent biological structure in a lung cancer cohort. Patients are represented as nodes, with edge weights defined by the product of radiomic similarity (Gaussian kernel on standardized features) and survival similarity (exponential decay of survival differences). A k -nearest-neighbor graph ($k = 10$) preserves local structure, and spectral clustering of the graph Laplacian to identify three distinct risk groups corresponding to poor, intermediate, and long survival.

Anne Howell

UG

University of North Florida

Ramsey Theory for Finite Graphs: Complete disorder is impossible

Ramsey theory formalizes the principle that sufficiently large structures must contain highly ordered substructures. The theory is introduced through the classical result that any group of six people necessarily contains either three mutual acquaintances or three mutual strangers. We discuss this in the context of edge-colored complete subgraphs. Following the inductive proof, a non-trivial example illustrates how Ramsey numbers arise naturally and why determining exact values is difficult.

Austin Anderson

F

Florida Polytechnic University

Extremal Combinatorics with Sums of Squares

We discuss the behavior of optimizers for the following discrete optimization problem: Given a set of positive integers $S_n = \{1, 2, \dots, n-1\}$, what is the smallest number of subsets, $M(n)$, partitioning S_n with the property that the sum of the squares of the elements in each subset is at most n^2 ? We present numerical evidence supporting the conjecture that M_n is as large as possible: That is $M_n = \left\lceil (\sum_{j=1}^n j^2)/n^2 \right\rceil$. We further connect this problem to hypergraph matching theory.

Andrew Murphy

UG

Embry-Riddle Aeronautical University

Principal Component Analysis Applications for Wide-Field-of-View Lenses

Wide-Field-of-View (WFOV) lenses are becoming popular in facial recognition due to the fact that they enhance subject coverage and improve the chances of detecting target faces. However, wide-angle optics introduce nonlinear distortion around the image periphery, which degrades the performance of recognition pipelines. This work presents a feasibility analysis of applying a simple, computationally lightweight principal component analysis (PCA) facial-recognition method to WFOV imagery by quantifying match-percent accuracy between eigenvalues of distorted faces and a training set derived from undistorted, forward-facing images. The results provide an approximate region of WFOV lens space where PCA facial recognition remains viable.

Donald McGinn

F

University of West Florida

Prime Producing Polynomials, Pell-type Equations, and the Near-square Prime Conjecture

An outstanding conjecture in number theory is that there are infinitely many near-square primes, which are primes of the form x^2+1 . In this talk, we analyze the factorizations of near-square integers and make a connection to Pell-type equations. Also, we show multiple conjectures that are equivalent to the near-square prime conjecture.

Gayathri Krishnan

F

University of Central Florida

Self Advection of a Thin Vortex Filament in Incompressible Fluid

A thin vortex filament in an incompressible fluid, experiences self-induced motion. The self-advection of the filament is explored by working with three models: Da Rios-Betchov, Hasimoto, Shivamoggi-van Heijst formulations. These models were derived using the Local Induction Approximation for the velocity of the filament. Numerical solutions to these formulations using Optimal Homotopy Analysis Method are presented. The viscous effects in the fluid cause a slipping motion of the filament. The effects of slipping motion on the kinematical and dynamical properties of the filament are investigated.

Jonathan Bartik

UG

University of North Florida

A Mathematical Model for Coupled Rocket Trajectory and Passive Stability

*Sounding rockets are simple-bodied aerospace vehicles consisting of a nosecone, fuselage, and stabilizing fins, used to study atmospheric and flight behavior. Rocket trajectory is governed by position, velocity, and fuel mass, while stability is described by nose angle and roll, with **passive stability** implying sole reliance on aerodynamic design. Although small changes in orientation can strongly influence overall motion, trajectory and stability are typically modeled separately. In this paper, we develop a coupled mathematical model using a system of ODEs and analyze the system through trajectory plots, phase-plane diagrams, and a compounded static margin formulation to illustrate stability behavior.*

Anne Howell

UG

University of North Florida

Frucht's Theorem

A deep and surprising connection between group theory and graph theory exists: every finite group arises as an automorphism group of a finite graph. Algebraic and graph-theoretic foundations underlying the theorem are introduced, including group actions, generators, and graph automorphisms. An interesting construction employing pendant subgraphs is examined, through which directed Cayley graph structure is replaced by an equivalent undirected representation. Examples, accompanied by detailed diagrams, are provided to illustrate explicit constructions of graphs whose automorphism groups are isomorphic to prescribed finite groups.

Binod Rimal

F

University of Tampa

Neural Signatures of Meditation Expertise: EEG-Based Unsupervised Modeling

As mental health and stress management are growing concerns, the demand for effective mental wellness and overall well-being continues to rise. Meditation is increasingly recognized as an effective approach for managing mental health. This study aims to determine whether an individual is an expert meditator based on Electroencephalography (EEG) signals using unsupervised machine learning models. The comparative study examines whether core EEG signals alone are sufficient or if external sensory information is required to identify meditation expertise. These findings strengthen the scientific credibility of meditation and support its broader adoption in both clinical and everyday settings.

Mohamed Jaber

F

Florida Institute of Technology

Interpretable Radiomics for Survival Prediction in Non-Small Cell Lung Cancer

Anatomic staging incompletely captures tumor biology in non-small cell lung cancer (NSCLC). Using 398 NSCLC patients from TCIA, we evaluated whether CT radiomics provides a compact, interpretable prognostic signal beyond stage. One hundred seven features were grouped into biologically motivated families and analyzed with a multivariate sparse group lasso Cox model (MSG Lasso Cox), with cross-validation and stability selection. A subset of radiomic features was identified as the dominant predictor of survival. This subset stratified the patients across different subgroups and revealed risk heterogeneity that was not explained by stage alone.

James Young

UG

Florida Polytechnic University

Integer Factorizations and Exact Zero-Divisor Graphs of the Integers Modulo n

In the integers modulo n , a pair of zero-divisors are exact if they generate each other's annihilators. We will explore the relationship between the structure of exact zero-divisor graphs and integer factorizations. In particular, an algorithm is presented that efficiently computes these graphs, which are then stored in an interactive database. Computational properties are considered with a view toward potential cryptographic applications.

Jay Nulph

G

University of Central Florida

Spatial Autoregression Model: Dependent Errors

Asymptotic results are given for testing $H_0 : \alpha = \beta = 1$ for the doubly geometric model $Z_{ij} = \alpha Z_{i-1,j} + \beta Z_{i,j-1} - \alpha\beta Z_{i-1,j-1} + \delta_{ij}$, where δ_{ij} is a dependent error structure. The Gauss-Newton estimation procedure is used.

Raymond Clines



UG

University of North Florida

Generalizing Pascal's Triangle

Pascals' Triangle and its many properties have been highly studied by mathematicians. In this presentation, we will explore its extension into 3 dimensions with Pascals' Pyramid. First, we will establish an indexing system for the pyramid and then use this to generalize the properties of the triangle into higher dimensions. We will also introduce and prove several theorems about the pyramid's structure and show its application to other areas of combinatorics and probability.

Mariya Ivanova



F

University of Tampa

Teaching Smarter, Not Harder - 10 Practical Ways AI Can Transform the Classroom

This session explores how Artificial Intelligence can serve as a powerful "co-pilot" for educators, moving beyond the hype to focus on ten practical, high-impact applications for the modern classroom. From streamlining lesson planning and administrative tasks to providing instant student feedback and supporting differentiated instruction for diverse learners, participants will discover how AI tools can significantly reduce burnout while enhancing personalized learning. The presentation balances innovation with responsibility, addressing essential ethical considerations such as data privacy and academic integrity.

Global-Local Method for Poroelasticity Problems with Localized Pressure Effects

In many poroelasticity applications, pressure effects are confined to a small region, making it inefficient and possibly unnecessary to solve the full system across the entire domain. Instead, we propose to solve the poroelasticity problem locally, where pressure effects are significant, and use a simpler linear elasticity model elsewhere. This creates a coupled elasticity-poroelasticity problem with transmission conditions. To solve this coupled problem, we propose a new non-intrusive global-local algorithm that iteratively solves the elasticity problem in the entire (global) domain and the poroelasticity problem only in a local domain, ensuring proper transmission conditions across the interface. This approach, which extends the existing global-local concept applied to single-physics problems to multi-physics systems, significantly reduces computational cost, especially when the local domain is much smaller than the global one. Numerical experiments demonstrate the robustness and efficiency of the method, showcasing its potential for providing an efficient solution for more complex multi-physics problems with localized effects of a single physical process.

Jared Bunn

F

Florida Polytechnic University

The Putnam at Florida Poly – My Experience

In this talk, I will discuss my experience in training a small group of students at Florida Polytechnic University to prepare for the most recent MAA Putnam Competition. I will share my approach to the training sessions and my experience supervising the competition. In addition, I will share my thoughts on why I think more students should participate in the Putnam competition. .

Hayden Tyler

UG

University of North Florida

p -adic Numbers and the Hasse Principle

In this paper, we discuss the p -adic numbers and the Hasse Principle. We begin by defining absolute values, but with more detail than usual. Of interest to us is the p -adic absolute value. Using this notion, we construct the p -adic numbers as an extension field of the rational numbers using Cauchy sequences of rationals. However, we will use the p -adic absolute value rather than the usual absolute value. We then provide basic properties of the p -adic numbers and define common arithmetic operations on them. Finally, we discuss the Hasse Principle, which suggests that we can learn about the field of rationals by studying the real numbers and p -adic numbers.

Raymond Clines

UG

University of North Florida

An Introduction to the Mathematics of Juggling

In addition to its entertainment and visual appeal, the art of juggling offers substantial opportunities for mathematical analysis. In this presentation, we will formalize juggling into a notation system called siteswap, and provide examples and a live juggling demonstration of how siteswaps correspond to real juggling patterns. We will also define and prove the necessary conditions for a siteswap to be a valid pattern. Additionally, we will discuss the enumeration of siteswaps and more advanced juggling techniques.

Erin Griesenauer

F

Eckerd College

Leveraging Trauma-Informed Pedagogy to Support Students Through a Hurricane

Experiencing a hurricane can be traumatic for students and faculty alike. By taking steps to acknowledge this trauma, we can help our students stay focused and motivated in the event of an evacuation. In this talk, I will provide an introduction to trauma-informed pedagogy. We will discuss how the principles of trauma-informed pedagogy can be translated into concrete course policies and activities in a mathematics class. We will focus on how these considerations can be used to help support students during a semester with an emergency evacuation, including ideas for what to do before, during, and after an evacuation.

Combinatorial Approach to Course Scheduling at Florida Polytechnic

School operations, such as the timetabling problem, become a difficult optimization model as school enrollment increases. Allocating resources such as educators, classrooms, and time slots, under criteria like course level and course sequencing, is an integer NP-hard problem. This presentation will cover our ongoing work on two approaches to the timetabling problem. The first being a genetic algorithm and our analysis of different crossovers and mutation strategies, the second being the construction of a combinatorial model.

Causal Effects of Urban Amenities on airbnb Prices: A Hybrid Spatial Filtering Approach

We study the effects of urban amenities on nightly prices in short-term rental platforms such as airbnb. Prices are determined both by property characteristics and by their spatial location, which introduces complex local and neighborhood-level variations. We analyze airbnb listings in Broward County, Florida, using a two-stage semiparametric framework with explicit spatial tuning. A generalized additive model captures nonlinear effects of property attributes and broad geographic trends, while a low-rank Moran eigenvector basis filters residual fine-scale spatial dependence. This approach provides a data-driven framework to assess the spatially heterogeneous influence of amenities and neighborhood features, and offers interpretable insights into pricing strategies in densely distributed urban rental markets.

Robin Zide

F

Indian River State College

Equations of the Mind: Linking Algebra, Psychology, and Authentic Life for Student Wellness

This interactive session explores Equations of the Mind, a linked learning model connecting College Algebra, Introduction to Psychology, and Authentic Life. Participants will experience how the family of functions and the Absolute Value Theorem serve as metaphors for personal growth and post-traumatic transformation—illustrating that positive inputs yield positive outcomes, while setbacks can still produce strength and insight. Rooted in cognitive psychology and student wellness, this approach blends quantitative reasoning, emotional intelligence, and reflective practice to enhance engagement, resilience, and purpose in both mathematics education and life learning.

Anurag Katyal

F

Palm Beach State College

Creating AI-Resistant Interactive Activities to Facilitate Active Learning

*Do you want to create AI-resistant, engaging, interactive activities to facilitate active learning for your students? This hands-on workshop will introduce participants to the core features of Doenet, a free and open source platform, including answer checking, graphing, and randomization. Participants will work on designing their own classroom-ready learning activity, with opportunities for feedback. **Bring a laptop.** No prior programming experience necessary, but experience with \LaTeX will be helpful.*

Mobile Apps for Stats & Data Science Education

In this workshop, I will introduce the Art of Stat mobile app for iOS and Android to explore and illustrate statistical concepts effortlessly and interactively. The app includes eight modules on topics such as Probability Distributions (Normal, Binomial, . . .), Statistical Concepts (i.e., Central Limit Theorem), Exploratory Data Analysis, Linear and Logistic Regression, and Machine Learning. Together with the audience, I will demonstrate how these modules can be effectively integrated into classroom teaching (both in-person and remote), used on homework assignments, and incorporated into student projects. The app ships with a wide selection of built-in datasets to motivate each statistical method.

Calculus as the Engine of Large Language Models

Large language models such as ChatGPT now shape how our students write, study, and interact with information. But what mathematics actually powers these systems? This talk reveals that at their core, modern AI models are trained using ideas familiar from undergraduate calculus: derivatives, gradients, and the chain rule. We will frame language-model training as a large-scale optimization problem, beginning with a simple notion of “loss” and building intuitive geometric pictures of error landscapes, gradients, and gradient descent. Visual metaphors will be used throughout to show how partial derivatives guide learning and how backpropagation is nothing more than the chain rule applied at massive scale. Designed for math educators, this talk emphasizes conceptual understanding over technical detail and highlights concrete ways these ideas can be used to motivate calculus topics in the classroom. No background in machine learning is assumed.

Tharindu De Alwis

F

University of West Florida

A Unified Envelope Framework for High-Dimensional Matrix-Valued Time Series

We will talk about coin tossing space and interesting mathematical connections that come with it. This probability space is the natural setting for analyzing convergence of a harmonic series with randomly assigned plus and minus signs. We will talk about the probability that two numbers are relatively prime and some discrete probability problems that lead to truncated harmonic series.

Stephen Jennings

F

MathGPT.ai

MathGPT.ai: An AI-Powered Platform Built for Math

Learn how MathGPT.ai provides curriculum-aligned, instructor-led AI tutoring that is accurate, cheat-proof, and infinitely patient-built within a complete course and assignment management system. This session will highlight how MathGPT.ai supports student understanding, reduces math anxiety, and maintains academic integrity while offering an affordable solution for departments. Faculty will also learn how to explore the platform and participate in Summer or Fall 2026 pilots.

Boundedness, Stability and Turing Patterns in a Quasilinear Three-species Model With Prey-taxis and Predator-repulsion

This study provides a rigorous mathematical analysis of a quasilinear reaction-diffusion system modeling a one-prey, two-predator ecosystem subject to attractive prey-taxis and mutual predator-repulsion. The primary results include establishing global existence and uniform boundedness of classical solutions for spatial dimensions $d \leq 2$ by deriving uniform-in-time a priori estimates based on energy methods, maximal regularity, and a bootstrapping procedure. The study employs Lyapunov functional analysis to derive sufficient conditions for the global asymptotic stability of both the prey-only equilibrium and the interior coexistence equilibrium. Crucially, Turing instability analysis demonstrates that the sole mechanism of predator-predator repulsion can induce diffusion-driven instability in the system, leading to the formation of non-constant positive steady states characterized by spatial segregation and anti-phase patterns in the competing predator densities, thereby acting as a mechanism for predator coexistence. Numerical simulations are also carried out to complement the theoretical results.

Gayathri Krishnan

F

University of Central Florida

Self Advection of a Thin Vortex Filament in Incompressible Fluid

A thin vortex filament in an incompressible fluid, experiences self-induced motion. The self-advection of the filament is explored by working with three models: Da Rios-Betchov, Hasimoto, Shivamoggi-van Heijst formulations. These models were derived using the Local Induction Approximation for the velocity of the filament. Numerical solutions to these formulations using Optimal Homotopy Analysis Method are presented. The viscous effects in the fluid cause a slipping motion of the filament. The effects of slipping motion on the kinematical and dynamical properties of the filament are investigated.

Bernhard Klingenberg

F

New College Florida

Mobile Apps for Stats & Data Science Education

In this workshop, I will introduce the Art of Stat mobile app for iOS and Android to explore and illustrate statistical concepts effortlessly and interactively. The app includes eight modules on topics such as Probability Distributions (Normal, Binomial, . . .), Statistical Concepts (i.e., Central Limit Theorem), Exploratory Data Analysis, Linear and Logistic Regression, and Machine Learning. Together with the audience, I will demonstrate how these modules can be effectively integrated into classroom teaching (both in-person and remote), used on homework assignments, and incorporated into student projects. The app ships with a wide selection of built-in datasets to motivate each statistical method.

Graduate Fair

We will be using *the Community Room* on the southeast side of the Building 3, the Carol F. Probstfeld Library & Learning Center and Family Heritage House.

5:00 – 5:50

Carol F. Probstfeld Library & Learning Center and
Family Heritage House
Community Room

Florida Atlantic University (FAU)

Florida Gulf Coast University (FGCU)

Florida Institute of Technology (FIT)

New College of Florida (NCF)

University of Central Florida (UCF)

University of North Florida (UNF)

University of South Florida (USF)

University of West Florida (UWF)

Posters

We will be using *the Community Room* on the southeast side of the Building 3, the Carol F. Probstfeld Library & Learning Center and Family Heritage House.

When and where?

Friday, February 20, 2026

5:00 – 5:50 PM

Carol F. Probstfeld Library & Learning Center and
Family Heritage House
Community Room

Graduate Students

Dylan Hewlett

G

University of North Florida

Mapping the Limits of Computation

Computability theory provides a framework for describing the fundamental limits of algorithmic problem-solving. This poster highlights these limits through several cornerstone results. Beginning with Turing machines and the Church–Turing Thesis, it uses the acceptance problem as a key example to illustrate how diagonalization reveals inherent undecidability. The poster then presents mapping reductions as a systematic tool for transferring undecidability between decision problems. Finally, it features Rice’s Theorem, demonstrating that every nontrivial semantic property of a Turing machine’s language is undecidable. Together, these results outline the broad boundaries that constrain automated reasoning about programs.

Brandon Cribbs

G

University of North Florida

Berlekamp–Massey Algorithm: The Problem of Managing Errors

Reed-Solomon Error-Correcting Codes are a generalization of Hamming Codes in that they correct multiple bits at a time rather than one but the resulting errors are distortions. The errors increase exponentially, which makes the decoding process difficult if not impossible. The Berlekamp–Massey algorithm ensures that the message will be decoded by allowing the errors to be bounded through an algebraic linear recurrence technique using an Error-Locator Polynomial.

Undergraduate Students

Joyce Henriquez

UG

Valencia College

The Paradoxical Nature of Motion and Infinity

Achilles and the Tortoise a story about a race between the two where the tortoise receives a head start. Creating a paradox between motion, infinity, and a finite distance. Achilles must travel infinitely many halfway points in order to reach the tortoise. This creates the paradox between motion and distance. In order to solve we need convergent series. This is because it is an infinite series with a finite solution. That is how motion and infinity can co exist. I will delve into the intricacies of how the paradox can be solved.

Aishwarya Ganapathy

UG

Valencia College

The Future Of Connected Intelligence: Artificial Intelligence (AI), Cloud Computing, Internet Of Things (IoT) In Modern Software

Modern software systems depend on integrating AI, cloud platforms, and IoT for connected intelligence. This presentation covers how IoT collects data, cloud platforms manage it, and AI enables smarter decisions. These technologies boost efficiency and automation, making their integration vital for secure and scalable applications in industries like healthcare, smart cities, and industry.

Anne Howell

UG

University of North Florida

Why Every Finite Group Appears as a Graph Automorphism Group

Frucht states that every finite group can be realized as the automorphism group of a finite graph. This poster presents the theorem together with a detailed inductive proof, illustrated by explicit graph constructions. An interesting technique using pendant subgraphs is examined, showing how directed behavior can be encoded within undirected graphs while maintaining the desired automorphism group.

Anne Howell

UG

University of North Florida

Why Large Graphs Must Contain Structure: Ramsey Theory for Finite Graphs

Any sufficiently large finite graph must contain a complete subgraph of bounded size. This poster presents the classical six-person problem as a concrete entry point into the general theory. Ramsey's Theorem for finite graphs is provided together with a detailed inductive proof.

Alice Tesser

UG

Rollins College

Admissions Data as a Window into Students' Perspectives on Food Insecurity

The study was motivated by a broader conversation about using admissions data to address social justice on campus. Specifically, it explores how such data can reveal students' past experiences and perceptions of food insecurity, guide administrations in policy implementation, and foster a more inclusive academic environment. The results indicate a significant association between the percentage of Free and Reduced-Price Lunch program participation at students' high schools and their enrollment at a small private liberal arts college. Furthermore, our findings emphasize the value of school-specific data over aggregated county-level statistics, underscoring the importance of school zoning policies versus ZIP codes.

Furio Gerwitz

UG

University of North Florida

Coloring Maps and the Five Color Theorem

Map coloring, the problem of finding the minimum number of colors with which you can color a map such that no two neighboring regions share the same color, is a classic practical application of graph theory. In this poster, we will formalize maps as planar graphs and prove the Five Color Theorem, which states any map can be colored with at most five colors. We will additionally discuss the significance of the stronger Four Color Theorem, proved much later with nonstandard techniques.

Furio Gerwitz

UG

University of North Florida

Perfect Codes

Perfect codes are algebraic structures in which every word of length n over a finite alphabet serves as either a codeword, or as a fail-safe within correction distance of a codeword. In this poster, we introduce Hamming codes, the most famous family of perfect codes, which have a rich history of use in computing and telecommunications. We will prove their perfection by showing they meet the Hamming bound, the fundamental characteristic of perfect codes. Additionally, we prove Hamming codes' error correction capabilities, discuss their properties as linear codes, and provide methods for their construction.

Embry-Riddle Aeronautical University, Daytona Beach

Low-Rank Spectral Analysis for the Reddening of the Seven Sisters Star Cluster

The Pleiades, also known as the Seven Sisters, is a stunning star cluster located approximately 440 light-years from Earth. This vibrant assemblage of hot blue stars in the Taurus constellation can be admired with the naked eye or through binoculars during early autumn. In this project, we utilize spectral theory to measure the reddening in the Pleiades star cluster. To evaluate the impact of interstellar dust on reddening, we employ principal component analysis (PCA) on a matrix representing color indices from various photometric bands linked to the cluster's photometric data. This dataset was obtained from VIZIER. Our PCA analysis of the photometric band matrix revealed that reddening is notably influenced by the color shift observed predominantly in the BP band. Ultimately, our numerical findings were verified, demonstrating an alignment with the extinction laws utilized by Gaia DR3. This is due to the fact that the PCA-derived reddening vector displayed an angular deviation of only 0.170° from the theoretical reddening vector, resulting in a minimal overall percentage difference of 0.294%. This is a joint work with Angelina Scalice, Madison Warner, Kevin Numbe, and Sirani M. Perera.

Determining Material Transport Method for Moon Colony Using Differential Equations

Large-scale lunar construction requires transporting vast quantities of material from Earth to the Moon. Two competing infrastructure concepts are high-cadence reusable rocket launches and a space elevator system (“Galactic Harbour”). While rockets have proven operational feasibility, they suffer from high marginal cost per ton and discrete failure risks. In contrast, a space elevator provides continuous throughput but introduces time-dependent mechanical risks such as sway stabilization, fatigue, and transfer slip at the apex hub. The purpose of this work is to develop a unified mathematical framework that compares both systems under consistent assumptions and evaluates which system achieves a target delivery of 100 million metric tons most efficiently.

Pascal's Pyramid: A Visual Analysis

Pascal's Triangle is a well-known structure in mathematics with many properties that have been thoroughly studied. In this poster, we will take a visual approach to exploring its extension into Pascal's Pyramid. We will first introduce an indexing system for the pyramid and use it to examine some of the pyramid's properties. We will also establish and prove several theorems about the pyramid's structure, including its formation with the generalized Pascal's Identity.



FRIDAY EVENING BANQUET

SCF STUDENT CENTER BUILDING

FEBRUARY 20, 2026



MENU

GRILLED SALMON WITH PESTO
CHICKEN MEDALLIONS WITH WHITE WINE AND CAPERS
MUSHROOM RAVIOLI WITH WILD MUSHROOM RAGU
SMASHED BABY REDS WITH SEA SALT AND ROSEMARY
SAUTEED GARLIC GREEN BEANS WITH CHERRY TOMATOES
SPINACH WITH PLANT CITY STRAWBERRIES
GOATS CHEESE AND CANDIED WALNUTS
WARM CHOCOLATE LAVA CAKE WITH CREME FRESCH
ICED TEA WITH MINT AND ROSEMARY INFUSED LEMONADE
SPA WATER





SATURDAY LUNCHEON

SCF STUDENT CENTER BUILDING

FEBRUARY 21, 2026



MENU

MEAT AND CHEESE LASAGNA

RATATOUILLE LINGUINE PASTA

GARDEN VEGETABLE SALAD

COOKIES AND BROWNIES

ICED TEA WITH MINT AND ROSEMARY INFUSED LEMONADE

SPA WATER



Entertainment



Tristan Titus, Daniel Rumbo, Miguel Yanez, Yonathan Ruiz-Nunez, Rael Lee, Mojdeh Khoshi
SCF Presidential Jazz Combo

Local Organization Committee

Anna Wasilewska

Robert Shollar

Joni Pirnot

C. Altay Özgener

Claire Geiger

Heather Pack

Julie Ott

Davidson Pierre

A Muhundan

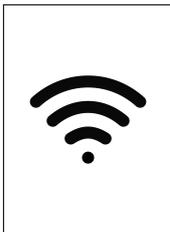
David Redett

Joe Ours

Jim Condor

Susan Reavis

Emre Özgener



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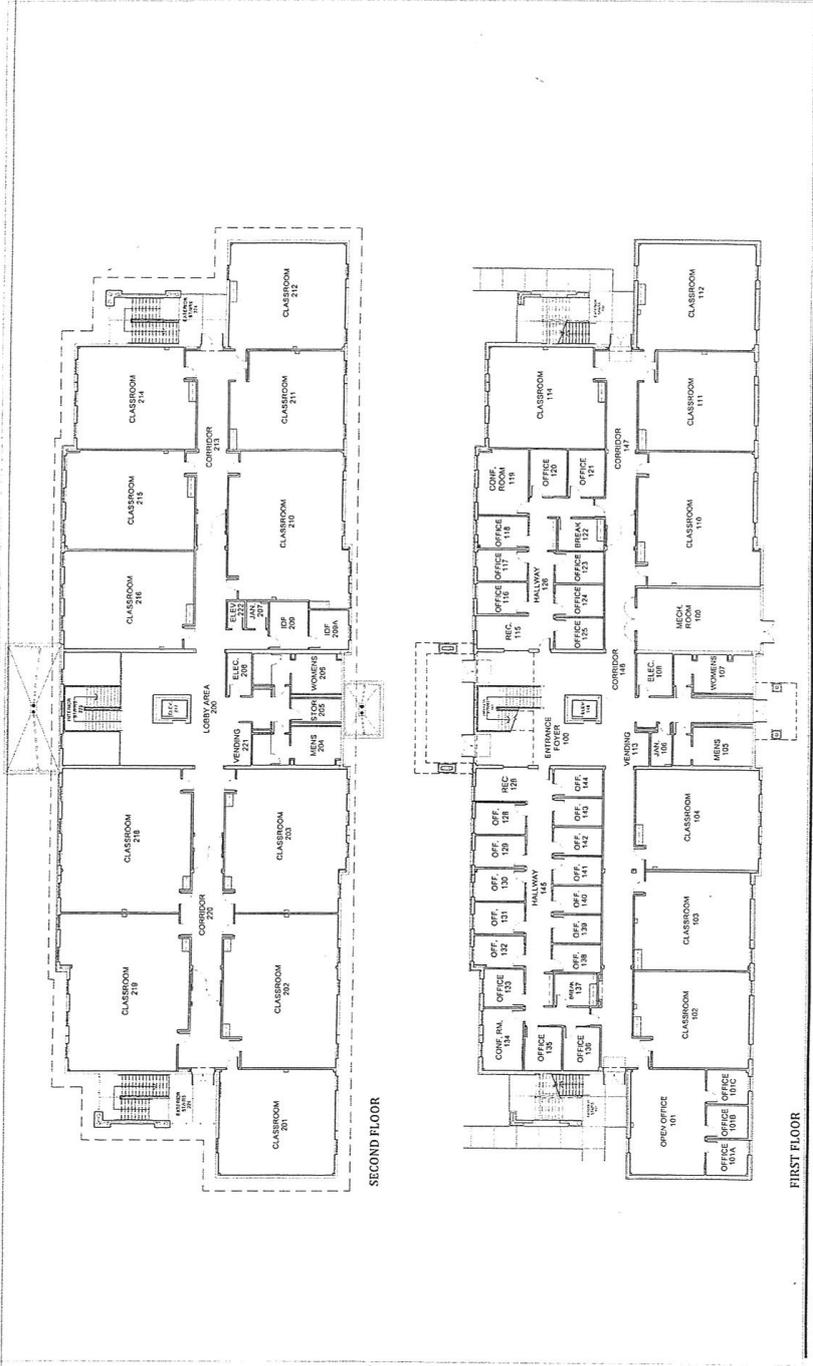


Directory

- | | | | | |
|---|---|---|--------------------------|--|
| 1 Student Services Center | 7 Office Complex | 11A Studio for the Performing Arts | 19 SCF Collegiate School | 26 Science Lab |
| 2 Radiography Lab and Dental Hygiene Clinic | 8 26 West Center | 12 Theatre/Athletics Warehouse | 20 Central Services | 27 Mathematics |
| 3 Carol F. Probstfield Library & Learning Center and Family Heritage House Museum | 9 Classroom Building | 13 Performance Pavilion | 21 Motorcycle | 28 Occupational Therapy Assistant and Physical Therapist Assistant |
| 4 The Quad | 10 Art & Design | 14 Student Union, Public Safety, SCF Store, TRIO | 22 Warehouse | 29 Nursing |
| 5 Academic Resource Center | 11 EAST: SCF Neel Performing Arts Center | 17 Gymnasium | 23 Operations | |
| 6 Information Technology Center | WEST: Music and Theatre Howard Studio Theatre | 18 Professional Development Center, FleetForce and Traffic Safety Institute | 25 Science | |
| | NORTH: The Gallery at SCF | | 25A Natural Science | |

All SCF campuses are tobacco-free.

Building #9 Map



BUILDING 9

STATE COLLEGE OF FLORIDA
 MANATEE - SARASOTA
 BRADENTON CAMPUS

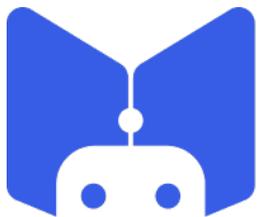
FIRST FLOOR

SECOND FLOOR



Transform
Learning

every learner
←————→
everywhere



MathGPT.ai™

Lumen LEARNING

