RooMath News

2024 UMKC Mathematics and Statistics Highlights

From the CAM Division Associate Director
Dr. Liana Sega

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Greetings, friends of our Mathematics and Statistics programs. As I am transitioning into the role of Associate Director, I would like to thank **Dr. Bani** for his leadership over the previous years. I am looking forward to working with our students and faculty in this new capacity.

We are once again looking back at the year that passed, to celebrate achievements. Our faculty continued an upward trajectory in publishing, securing research funding, and collaborations with colleagues across disciplines. Two of our PhD students graduated this summer, and others are making good progress. The **Math Club** has started the se-

mester strong and is engaged in building a welcoming community for Mathematics and Statistics students.

We had some changes in our faculty ranks. **Dr. Rhee** retired after a 37-year long career at UMKC, in which he stood out as a fair-minded colleague, highly organized teacher and patient mentor. We are pleased to welcome **Dr. Qiao Zhuang** as a new Assistant Professor, and we are confident that his expertise will enhance our research and teaching mission.

In the beginning of October, we hosted the 9th SIAM (Society for Industrial and Applied Mathematics) Central States Section Annual Meeting. The meeting brought together

Inside this issue:

over 200 faculty and students from across the country and featured 15 mini-symposiums, 3 plenary talks by renowned mathematicians and an NSF panel Q&A session.

Looking ahead, we plan on continuing to provide quality support to our students, and we plan to revise our curriculum, in order to stay up-to-date within a changing education landscape. We are excited to pursue new research avenues and bring our students along.

We wish everybody a successful 2024-2025 academic year, and we hope to hear your news and updates.

The 9th Annual Meeting of the SIAM Central States Section

The UMKC Mathematics and Statistics Program proudly hosted the 9th Annual Meeting of the SIAM Central States Section on October 5-6, 2024. The event was a tremendous success, drawing **over 220 participants**, including faculty and students from 32 states and 95 universities across the nation. The diverse gathering of mathematicians and researchers showcased the collaborative spirit of the conference, which featured a rich array of academic and networking opportunities. The meeting included 15 mini-symposia, each offering specialized discussions on cutting-edge topics in applied mathematics. In addition, numerous contributed talks allowed participants to present their latest research, and a vibrant poster session provided a platform for students and early-career researchers to share their findings. One of the highlights of the conference was an NSF discussion panel session, where funding opportunities and research priorities were discussed in detail, offering valuable insights to attendees interested in future collaborations and grant applications. The conference also featured three distinguished plenary talks by renowned applied mathematicians, whose contributions and expertise illuminated current trends and future directions in the field. These talks were well-received and served as an inspiration to all who attended.
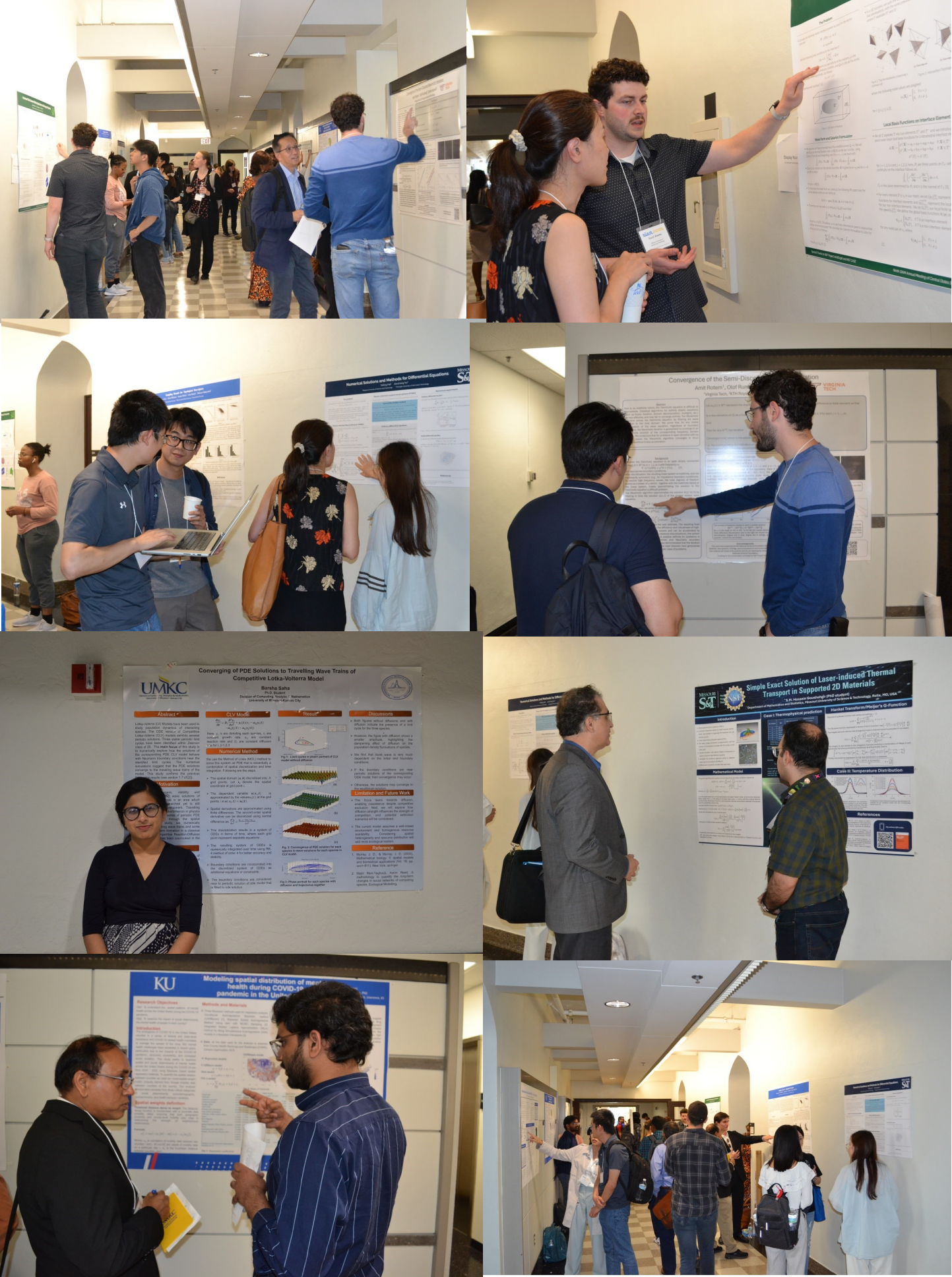

On Page One: Group photo of SIAM CSS Meeting participants; **Here:** Plenary Talks

More information here.

2024 SIAM CSS Mini-Symposiums at UMKC

Top Left: The president of SIAM Central States Section Dr. Xu Zhang announcing the **winners of the poster session**. **Top Right:** First Place: Amit Rotem, Virginia Tech, **Bottom Left:** Second Place: Easton Brawley, Missouri University of Science and Technology, **Bottom Right:** Third Place: Yingli Li, Colorado State University

The meeting opened with welcoming remarks by Professor Sumeet Dua, UMKC's Vice Chancellor of Research, and Professor Reza Derakhshani, Associate Dean of Research and Innovation at UMKC's School of Science and Engineering (SSE). Their addresses emphasized the importance of fostering innovation and interdisciplinary collaboration in the mathematical sciences.

This successful event was made possible through the generous sponsorship of the National Science Foundation (NSF), the Society for Industrial and Applied Mathematics (SIAM), and UMKC's School of Science and Engineering, whose support helped create a productive and engaging environment for all attendees.

UMKC Integration Bee 2024: Celebrating Mathematical Excellence

The **2024 UMKC Integration Bee** brought together a dynamic group of over 40 participants from UMKC and Platte County High School for an exciting afternoon of mathematical competition. Coordinated by Dr. Bani from UMKC and Kristi Whitmer, a dedicated math educator from Platte County High School, the event provided a platform for students to showcase their calculus skills in a spirited and engaging setting.

Held on **Tuesday, November 19, 2024**, in the Toyota Room of Flarsheim Hall (Room 531), the competition challenged students to solve intricate integrals under time constraints. The atmosphere was charged with enthusiasm as contestants battled through multiple rounds, demonstrating precision, speed, and deep mathematical insight.

Winners of the 2024 UMKC Integration Bee:

🥇 **First Place:** *Said Isakov* (Math and Stat Major) – **98/100**
🥈 **Second Place (Tie):** *Leher Malhotra* (Physics Major) – **96/100**
🥈 **Second Place (Tie):** *Jazmin Parra* (Civil Engineering Major) – **96/100**
🥈 **Second Place (Tie):** *Cierra Harris* (Math and Stat Major) – **96/100**
🥉 **Third Place:** *Karlee Riggs* (Platte County High School) – **93/100**

The event was more than just a competition—it was a celebration of mathematical passion and problem-solving.
With such outstanding participation and talent, the UMKC Integration Bee continues to grow as a tradition that inspires future generations of mathematicians and engineers. Congratulations to all participants for their hard work and dedication!

Student Helpers at the SIAM Meeting

Some of our undergraduate and graduate students assisted us in the management of the SIAM meeting: **Lauren Ukena**, **Ailing Nan**, **Michael Dang**, **Ravi Thota**, and **Rita Wanjiku**.

Ailing Nan wrote: "Lauren and I were at the registration table, and Ravi took some photos of us with the camera. I was sitting outside and didn't go in to listen to the conference, but Michael went in for a bit. I wasn't familiar with academic conferences before, but this experience gave me a certain understanding of them. Scholars from all over the country attended, and I think such conferences facilitate a lot of communication among them, leading to more sparks and the generation of more academic results."

Michael Dang wrote: "The conference was very enjoyable and motivating. I got a chance to talk to other students from different backgrounds. Attending talks was very helpful for me to gain additional insight into various topics in mathematics, especially in fluid dynamics. Overall, I really appreciate the UMKC - CAM division for hosting this conference."

Math Club and Math Gathering

The **UMKC Math Club** is alive and well! President **Lillie Jacobs** (left in first picture below) and Vice President **Audrey Plunkett** (right in first picture below) have been hard at work getting things up and running. There are **biweekly meetings** with additional events throughout the semester. Come by for some snacks and drinks, and a chance to get to know other math majors! To get updates and learn about events through the Discord page, email Lillie (lmj5hf@umkc.edu) or Audrey (adp6kc@umkc.edu).

Last August 23, 2024, we held a **Math Gathering**. Here are pictures of some of the students and faculty who attended:

Math Major Joan Rocha worked an Internship at Sun Life Financial Inc. during Summer 2024

Many mathematics majors secure internships in roles such as actuaries or data analysts within various corporations. During the summer of 2024, **Joan Rocha**, a mathematics major, completed an internship at **Sun Life**, a leading financial services company specializing in financial planning, life insurance, health insurance, and investment services.

Please introduce yourself and tell us about your high school and college experiences.

My name is Joan Rocha. I am a senior (rising Master's student) from **Spain**. After this internship class, I will be completing my BS in Mathematics and Statistics. About my professional experiences, during high school I really didn't have any job or internship, since it is very uncommon to find them in Spain. However, after arriving in the US in 2020, I was able to take part in three summer internships, along with four on-campus jobs. In terms of internships, in 2022 I worked as a data scientist intern, in 2023 as a data informatics/analytics intern, and lastly in 2024 as an information technology intern. At the same time, I worked as a mathematics college tutor between 2021 and 2022, and I am currently working as a lifeguard and IT assistant.

Where did your interest in math begin?

I would say it was during my last two years of high school. My math class started covering topics within calculus, like integrals and optimization. Then, when Covid hit I started doing online courses on math, and some data science. I believe that was the moment I decided to go for a Math degree.

What math and stat courses have you taken?

I am transfer student, and I arrived at UMKC in August 2022. The math classes I have taken here are:

- Calculus III

- Linear Algebra

- Sets and Proof

- Advanced Analysis

- Internship (In progress)

What kind of math and stat courses do you prefer?

I really enjoyed Calculus II and Calculus III. At first, I didn't like proofs at all. However, when we started doing proofs of Calculus theorems, I started enjoying proving. So I would say, my favorite kind of class would look like Advanced Analysis, where you combine Calculus and Proofs.

Which courses are more useful for your internship?

I would say, number one would be Linear Algebra, since I did some machine learning, especially with principal components, and the concept of eigenvalue was very important. Nonetheless, I think all classes are very useful to develop some soft skills that can be directly applied to technical tasks.

How do I get a math internship?

I would say Math is a very broad area of knowledge. Many employers are looking for math graduates, because they possess the problem solving and critical thinking skills that can be applied to not only teaching and researching in math.

You obtained an internship this year and worked full time during the summer. Could you tell us how you obtained the internship and how many other internships did you apply for?

In my case, it was typical to apply to hundreds of positions and wait until I hear back from the ones interested. So naturally, I applied to over 200 employers, and out of probability I would have some options to choose from at the end.

What kind of questions can we expect in an internship interview?

From the employer:

- What makes you special from other intern candidates?

- What are you expecting to get out of the experience?
- What value can you bring to us?
From me:
- Are the internships more project based? Or is it more day-to-day?

- Am I going to be treated as an intern or as a full time employee?

Name a few specific skills needed for a math or stat internship.

- Mathematical proficiency

- Programming language knowledge

- Data driven mentality

Tell us about the company that you worked for and its clients.

I interned at **Sun Life**, a leading financial services company offering insurance, investment, and retirement solutions. They worked with individual clients and businesses, providing tailored financial advice and support.

What are the career expectations and characteristics of your internship?

I would say it was an introduction to the IT professional path. The expectations were to both learn and provide, in this case, development of PowerBI reports and models, and at the same time resolve IT issues from within the company.

Do you consider the same company and job as a future career?

As of now, I would like to continue searching and working on different fields from within the IT, data, and math sector.

What are the most satisfying and most frustrating parts of your job as an intern?

The most frustrating part was definitely how time consuming it was to get the permissions to work on the company data. There was a very complex data governance structure that made data manipulation very tedious and time consuming. On the other hand, the most satisfying part was feeling useful. It was one of the first times where I felt like I was actually providing value and outcomes to my employer.

In what ways, have you benefited from having a summer internship?

Multiple ways. I think I networked a lot and I also got a real-life experience which cannot be found in college classrooms.

Where and how did you use mathematics or statistics in your internship?

I would say mostly when developing machine learning models, on PowerBI. However, as I have mentioned I think math provides a great amount of soft skills that can be utilized in many ways.

If you were not a Math and Stat major, you would be …?

I would try to pursue a life within the sport of Track and Field. I am about to start the last year of my eligibility, and I still enjoy every aspect of it. If I had to choose a completely different major, I would go for a History major, because I love learning about our past.

Tell us about the Math and Stat professors at UMKC.

I have enjoyed all my math classes at UMKC, and I think their professors are perfectly qualified for their job. I think they all combine being rigorous and very strict during the lectures, but making the exams fair for those who attend those lectures. Special mention to Dr. Hare (Computer Science) and Dr. Delaware, who were my professors during my last undergraduate year.

Where do you see yourself in the next 5 years?

I really do not know. I want to pursue a career in data science, however, I also want to continue doing Track and Field in a professional way. I have to decide whether to go back to Spain, or to stay in the US. So I would say that working as a data scientist while enjoying running, in either Spain or the USA.

What kind of hobbies do you have?

I love watching all kinds of movies and TV shows, and spending time with my loved ones. My favorite TV show is *Breaking Bad*, and my favorite movie is *Goodfellas*. I have recently enjoyed playing and studying Poker and its probabilities and theories, for which having a Math degree helps. I also consider running not only a "job" but also my biggest hobby.

# *Celebrating a Decade of Math & Stat Research Day at UMKC*

The **UMKC Math and Stat Research Day** is part of the **Research-A-Thon Day** organized by the Division of Computing, Analytics and Mathematics. It is an annual one-day event celebrating student and faculty research and creative and scholarly activities. The event promotes research in computer science, mathematics, statistics, and applications in various fields, and is open to the public. For this year, graduate students presented their research in a poster session. This was an excellent opportunity for them to network with others.

This year's winners of the poster session are:

First Place: David Wagner "Evaluating PDE-Refiner: Comparing a Neural PDE Solver Against Traditional Numeric Methods for Long Rollout of the 1D Kuramoto-Sivashinsky Equation"

Second Place: Arash Arjmand, "Analyzing Biosecurity Adherence and Antibiotic Resistance Dynamics in Animals and Humans through Mathematical Modeling"

Third Place: Michael Dang, "Probabilistic Learning on Manifold for Unsteady Fluid Dynamics Simulations under Uncertainties"

UMKC Math & Stat Research Day
April 12, 2024   10:00 AM - 1:00 PM
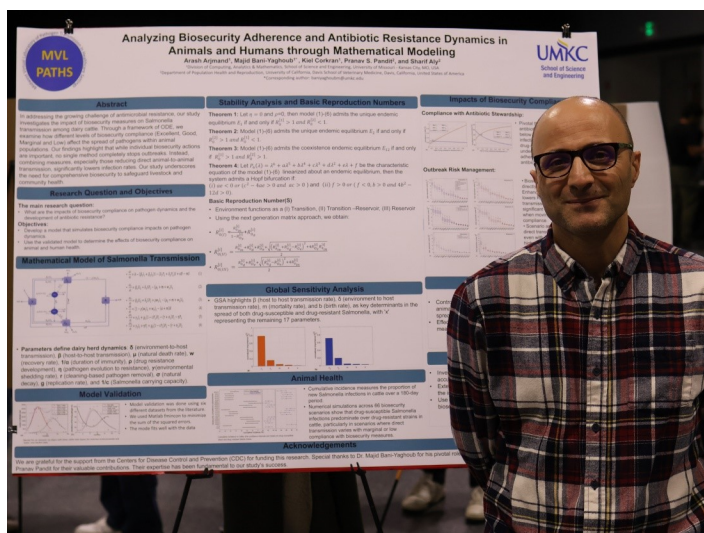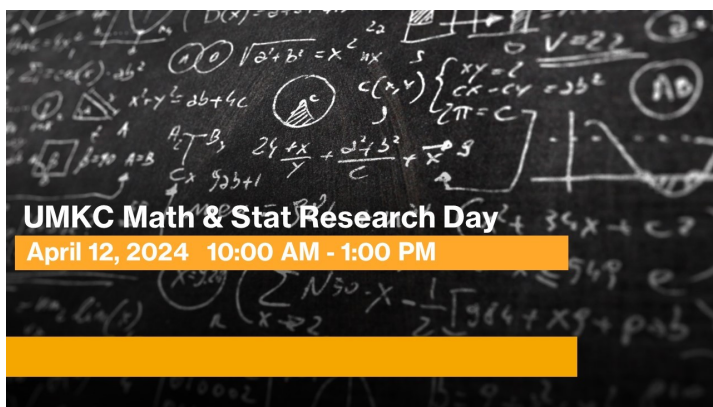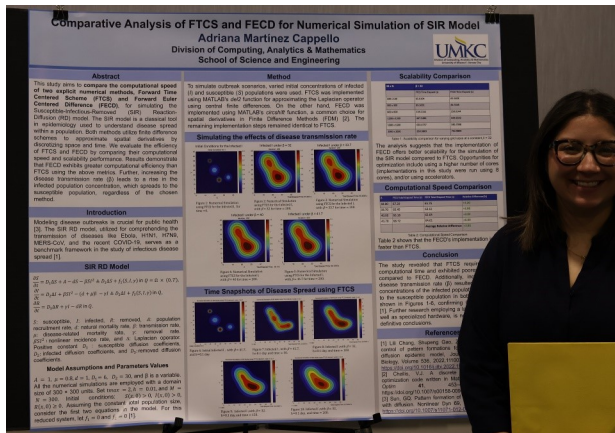
Congratulations to Recent Math and Stat Graduates

Mathematics and Statistics congratulates the following recent graduates with a bachelor's, master's or PhD degree in mathematics or statistics.

Spring and Fall 2024

Shannon	Burke	Mathematics & Statistics BS
Eric	Martin	Mathematics & Statistics BS
Joan	Rocha Navarro	Mathematics & Statistics BS
Dalton	Smith	Mathematics & Statistics BS
Ahmed	Albarwani	Mathematics & Statistics BS
Kaitlyn	Richmond	Mathematics & Statistics BS
Adaline	Wright	Mathematics & Statistics BS
Braden	Rosen	Mathematics & Statistics BS
Gianna	Cado	Mathematics & Statistics BS
Joshua	Walton	Mathematics & Statistics BS
Benjamin	Floyd	Mathematics Co-iPHD
Brendra	Kathariya	Mathematics Co-iPHD
Lucas	Delibas	Mathematics iPHD
Depak	Sireeshan	Mathematics iPHD
Rachel	Nordstrom	Statistics MS
Thomas	Giles	Statistics MS
Brian	Martinelli	Statistics MS
Kiel	Corkran	Statistics MS
Ailing	Nan	Statistics MS

New Discipline Distinction Honors Fall 2024

The School of Science and Engineering initiated Discipline Distinction Honors in Fall 2024. Congratulations to all the Mathematics and Statistics graduates so honored:

BS Mathematics and Statistics
Ahmed Albarwani
Jessica Burkhart
Kaitlyn Richmond

MS Statistics
Ailing Nan

# Undergraduate Math Majors Shine at the 10th Annual SUROP Poster Symposium

On **Thursday, August 29, 2024**, the **10th Annual Summer Undergraduate Research Opportunity Program (SUROP)** Poster Symposium took place in the Miller Nichols Learning Center's 1st-floor lobby. The event showcased a wide array of research from undergraduates across various disciplines, including outstanding contributions from Mathematics & Statistics.

Among the highlights was **Gianna Cado**, presenting from 11:30 a.m. to 1:30 p.m. Her research, conducted under the supervision of Dr. Majid Bani-Yaghoub, delved into the pressing issue of antimicrobial resistance. Titled **Using Mathematical Models to Analyze the Spread of Antimicrobial-Resistant Organisms Between Farms and Communities**, Gianna's work applied mathematical tools to address one of today's most critical public health challenges. Her analysis explored how resistance spreads across interconnected environments, providing insights into how to control the transmission of resistant organisms. [First image: Dr. Bani and Math Major Gianna Cado]
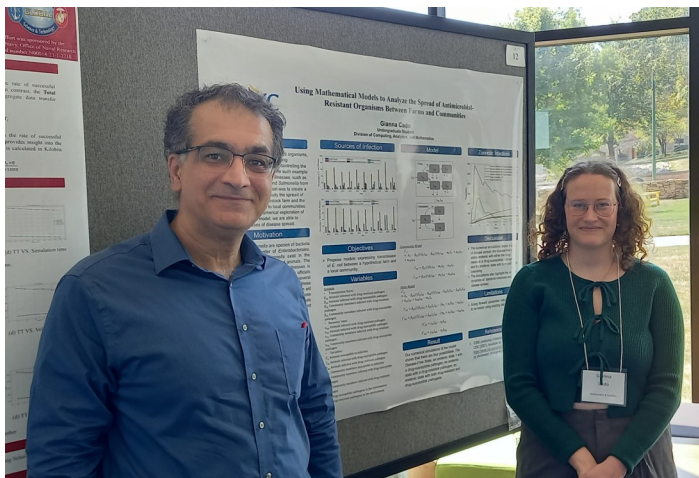
Earlier in the day, from 10:00 a.m. to 12:00 p.m., **Sudhiksha Kumar** took the stage to present her research, **Habitat Relationship between Sigmodon hispidus and Microtus ochrogaster**. Supervised by Dr. Aaron Reed, Sudhiksha's project focused on the ecological interactions between these two rodent species, analyzing their habitat preferences and competition patterns. Her work provides valuable data for understanding population dynamics in diverse ecosystems.
[Second image: Dr. Bani and Math Major Sudhiksha Kumar]
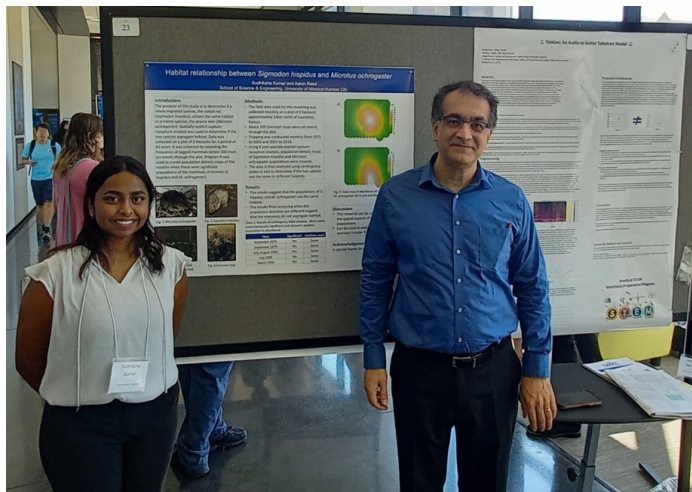
Both presentations highlighted the depth of research and creativity that undergraduate students bring to the field of mathematics and statistics. Through their research, Gianna and Sudhiksha demonstrated the critical role mathematics plays in solving real-world problems, from public health to ecological sustainability. The symposium was an inspiring display of student talent, marking yet another successful year for SUROP.

Celebrating Dr. Noah Rhee's Remarkable 37-Year Impactful Academic Career and Retirement

In Spring 2024, **Dr. Noah Rhee**, a distinguished applied mathematician and beloved educator, retired after 37 years of extraordinary contributions to both academia and his field. A Retirement Celebration was held for him on May 10, 2024. With **59 published papers** to his name, Dr. Rhee's scholarly output places him well above the average in his discipline, especially notable for his multiple publications in prestigious journals, including those of the **Society for Industrial and Applied Mathematics (SIAM)**. See here.

Dr. Rhee's work is particularly renowned in the realm of **matrix theory and numerical analysis**. Among his most outstanding contributions are papers like *"A Shifted Cyclic Reduction Algorithm for Quasi-Birth-Death Problems," "Numerical Stability of the Parallel Jacobi Method,"* and *"A Note on Relative Perturbation Bounds,"* published in top-tier journals such as the *SIAM Journal on Matrix Analysis and Applications* and *Nonlinear Analysis: Theory, Methods & Applications*. His research has not only pushed the boundaries of applied mathematics but has also garnered the respect of his colleagues. Dr. Bani, a colleague of Dr. Rhee, reflected, "I had the privilege of being Dr. Rhee's next-door colleague, benefiting immensely from his superior knowledge of Matrix Theory. His insights answered many of my questions and broadened my academic vision."

In fact, like many great mathematicians before him, Dr. Rhee's work might take time to fully reveal its significance. History provides similar examples, such as Alan Turing's 1952 paper on pattern formation, which only gained widespread recognition decades later. Dr. Rhee's pioneering efforts on **Yang-Baxter-like matrix equations** could very well follow a similar path of delayed appreciation, laying the groundwork for future advances in mathematics.

Dr. Rhee also made significant contributions beyond his core work in matrix theory. His collaboration with **Pawel Góra**, a

noted figure in chaos theory, yielded the groundbreaking paper *"Predicting and Estimating Probability Density Functions of Chaotic Systems,"* published in *Discrete and Continuous Dynamical Systems-B*. This paper demonstrated that even in chaotic systems, there is an underlying order, a concept that continues to influence the study of dynamical systems and probability.

Beyond his research, Dr. Rhee's impact as a caring and committed educator is reflected in the numerous accolades he received for his teaching and student advising. His instructional abilities earned him the *Honorable Mention for the Excellence in Teaching Award* at Michigan State University in 1987, followed by the *Outstanding Faculty Award* from the University of Missouri-Kansas City's Office of Student Life in 1992. Additionally, his teaching evaluations were consistently rated as "Very Good" or "Outstanding" throughout his career, a testament to the lasting impact he had on his students.

Dr. Rhee's influence extended far beyond the classroom and into the realm of service and mentorship. For 14 years, he served as the **PhD Math Coordinator**, guiding more than 90 PhD students as a co-discipline advisor or committee member. His leadership in the **UMKC Applied Math Group**, founded in 2015, helped secure internal grants for excellence and facilitated multiple public lecture series on applied mathematics. The mini-symposiums Dr. Rhee helped organize at SIAM annual meetings remain a legacy of his dedication to expanding the reach of applied mathematics research.

As Dr. Rhee steps into retirement, his legacy of scholarship, education, and service will continue to inspire future generations of mathematicians. His work stands as a beacon in applied mathematics, where its full impact is only just beginning to be understood. Dr. Rhee's career is a testament to the power of perseverance, insight, and a lifelong commitment to the advancement of knowledge.

Historical Series about former Students or Faculty: An International Master's Student Story

Enuenwemba Obi, a native of Warri, Nigeria, came to the U. S. in Feb. 1952 as part of a group of seven Nigerians on missionary scholarships. He was 26 and had previously taught mathematics at a mission high school and completed a senior English certificate from the University of Cambridge, England. He first studied at McPherson College in McPherson, KS, where he seems to have informally adopted the first name "Joseph".

TIME magazine, in its Dec. 29, 1952, vol. 60, issue 26, p. 11, published an article titled "The One-Town Skirmish" describing the effect those seven black Nigerians had on the then segregated town of McPherson, recording one of "Joe's" experiences, and how one woman brought the people around to accepting these new student residents. In the Jan. 19, 1953, vol. 61, issue 3, *Time* letters section, a letter from Enuenwemba was published:

"Sir: I have to thank you on behalf of my other comrades for your leading article [*TIME*, Dec. 29]. You cannot imagine what a world of good the publication has done. Letters have been streaming in to all of us, especially to Mrs. Switzer, and it affords one great joy to know that there are a great many sympathizers for the noble cause which alone has a tremendous power to stay the tide of that monstrous ideology, Communism . . . JOSEPH ENUENWEMBA OBI McPherson College McPherson, Kans."

After two years at McPherson College, he moved to the University of Kansas City (UKC, now UMKC) to study mathematics on a full scholarship for his senior year, 1954-1955. There he became president of the Cosmopolitan Club, initiating on Oct. 17, 1954 a series of programs featuring talks. He'd also begun writing for West African newspapers, such as the *West African Pilot*, and the *Nigerian Citizen*. After graduating from UKC in 1955, he held a graduate teaching assistantship at the University of Nebraska in Lincoln, NE. In 1957, he became a part-time Instructor in Physics at Park College in Parkville, MO, and won a teaching fellowship becoming a Lecturer in Mathematics for our department at UKC during 1957-58. In June 1958, he earned his M.S. degree. His advisor was Dr. Maria Castellani, and his 88-page master's thesis was titled **_The Prime Number Theorem_**.

That summer in the *Washington Afro-American* newspaper of Washington, D.C., on Aug. 12, 1958, p. 11, appeared the notice "Kan. College post goes to African." He'd been hired as an Assistant Professor in Mathematics and Physics at Bethany College in Lindsborg, Kansas. A similar notice about him appeared in the national magazine *Jet*, Aug. 21, 1958, p. 23, "African 1st Negro Prof at Bethany College," and a note of his appointment

was later published in the *American Mathematical Monthly*, News and Notices, in Dec. 1958. [Image Source: *Bethanian Yearbook* 1960]

In 1960, he left Bethany College and received a fellowship to Kansas State University in Manhattan, KS, to study Physics during summer and fall of 1960. During 1961-1962, he accepted a position at Wiley College in Marshall, Texas as Assistant Professor in the Division of Natural Sciences.

In Spring 1962, he wrote a short 78-page book **Peace-Corpsism**. The UMKC Miller Nichols Library has a copy donated by him, with the handwritten inscription "To U.K.C. Library, compliments of the author..., Nov. 2, 1962." In the May 19, 1962 preface, he says he is "deeply indebted to my friends and close associates", among others, Dr. Jerry Bails and Dr. Norman Royall, Jr."all of whom I had met at the University of Kansas City and with whom I had many lively sessions." He ends with:

"Last but certainly not least, I will ever cherish the memory of the free and stimulating atmosphere of the University of Kansas City, an institution which made so much difference in my outlook on life."

He then moved to Wichita State University, Wichita, Kansas, as an Instructor in Mathematics for 1962-63, before returning to Warri, Nigeria. His later career path included being Senior Mathematics Master at Hussey College in Warri, 1964-65, Principal at Atamakolomi Trade School in Warri, 1965-66, Senior Master and Vice-Principal at Urhobo College, Effurun, 1968-70, Principal, Ika Grammar School in Agbor, 1970-72, Senior Lecturer and Head, Department of Mathematics, College of Education, Abraka, 1972-79, and finally Senior Lecturer, Institute of Education, University of Benin, Benin City, 1979-86, when he retired.

He'd continued his education at the University of London (External Student), 1969-72, the University of Ife (now Obafemi Awolowo University) in Ile-Ife, 1974-76, and Temple University, Philadelphia, USA, 1978-80, and wrote three further books, *Philosophical Foundations of Education* in 1980, *Science is Discovery* for the Bendel State Government Series, (co-author, Longman) in 1982, and *Basic Philosophies & Education* in 1989. [Sources: Web page here and website here accessed 22 Feb. 2025.]

The UMKC Math Academy

Entering its third year, the **UMKC Math Academy** is continuing to provide quality math and STEM opportunities to the students of Kansas City. **Joe Morse** (morsejo@umkc.edu, Flarsheim room 336B) took over as Director of the School of Science and Engineering Math Academy in summer 2022.

The Math Academy is built on four pillars: Student Academy, Dual Credit, Professional Development and a Bridge Program.

This year, the Math Academy is providing a high level of instruction to 15 dual credit math classes in five high schools in Kansas City Public Schools. Because of this, over 300 students have the opportunity this year to strengthen their math knowledge to prepare for college all while earning college credit.

As well as providing instruction to students, the Math Academy has hosted a number of professional developments for the KCPS teachers. Teachers collaborate with UMKC faculty and staff to enhance their best practices by exploring some of the latest teaching strategies, making their classrooms more engaging for the students.
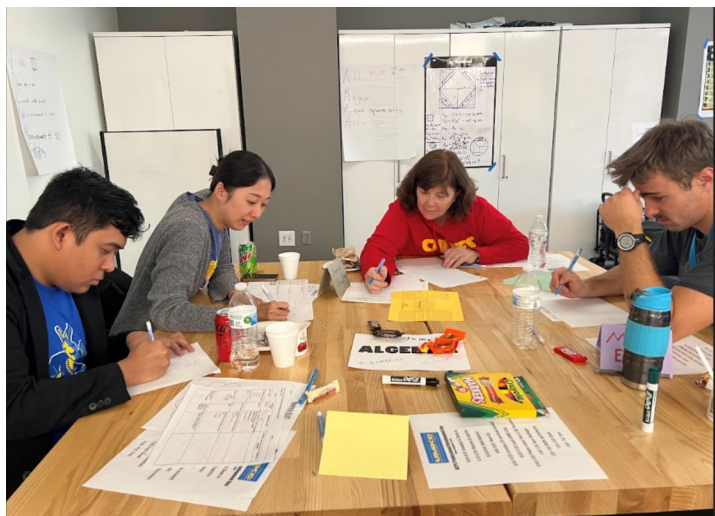

Also in the works is the launch of a student academy that will give students opportunities to express their passion for math and STEM by working collaboratively on real world issues and creating innovative solutions.

In the future, the Math Academy will continue to highlight the wonderful programs at UMKC, especially in the School of Science and Engineering.

Digitizing the Films of Dr. Norman N. Royall, Jr. Continues

Dr. Norman N. Royall, Jr. (1908-1983) was a celebrated UMKC faculty member in Mathematics and Physical Science 1947-1975, Dean of the College of Arts and Sciences 1947-1953, winner of the UM System Thomas Jefferson Award in 1974, and for whom Royall Hall was named in 1983. Between 1958 and 1961 he recorded **49 short films** (each about 30 min.) on College Algebra (20), Trigonometry (21), and Logarithms and the Slide Rule (8) for the United States Armed Forces Institute, to educate American servicemen around the world.

Those films, now over 60 years old, reside in our UMKC Archives in the Miller Nichols Library. Mathematics Teaching Professor Dr. Richard Delaware has been working with University Archivist Becky Briggs Becker since fall 2022 to get them all digitized. Those digitized so far can be seen on the Internet Archive - **Moving Image Archive** site here.
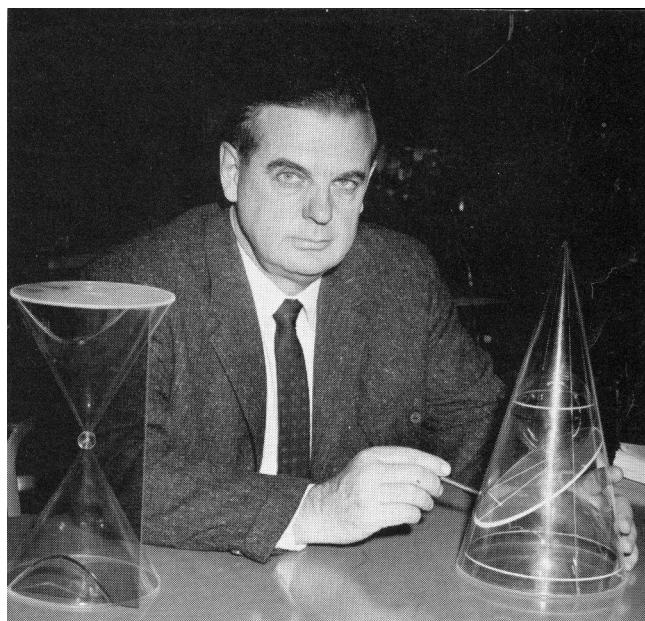
Norman N. Royall, Jr., 1963 ↑

Anyone interested in funding the digitization of one or more of the films should contact Dr. Delaware at delawarer@umkc.edu.

Recent Student News

Undergraduate **Rye Ledford** wrote an expository paper for Math 464 WI (taught by Dr. Richard Delaware), titled "**The Spanish Inquisition and its Impact on Mathematics in Spain during the Seventeenth Century: A Translation of Excerpts from J. Zaragoza's *Trigonometria Espanola***", which was published in the Honors Program undergraduate research journal *Lucerna* in March 2024.

Undergraduate **David Forson** wrote an expository paper for Math 464 WI (taught by Dr. Richard Delaware), titled "**Sangaku: The Mathematical Art of the Edo Period**", which won an **Honorable Mention** in the 2024 national History of Mathematics paper contest sponsored by HOM SIGMAA (History of Mathematics Special Interest Group of the Mathematical Association of America) which was also published in the MAA online journal *Convergence* in 2024.

David writes (2-28-2025): "I'm in the final semester of pursuing a dual B.S. in Mathematics and Computer Science, before transitioning into my M.S. in Computer Science with a focus on software engineering. I still study the Japanese language in my free time and aim to pass the JLPT N2 (Japanese Language Proficiency Test) around the time I finish graduate school. I really enjoyed working on the Sangaku/Wasan paper with you. It sits alone in the publications section of my resume."

Undergraduate **Jessica Burkhart** (who also earned a Discipline Distinction Honor as she graduated in Fall 2024) wrote an expository paper for Math 464 WI (taught by Dr. Richard Delaware), titled "**The Importance of Abu Kamil on Algebra**", which will be published in the Honors Program undergraduate research journal *Lucerna* in March 2025.

Undergraduate **Dalton Smith** wrote an expository paper for Math 464 WI (taught by Dr. Richard Delaware), titled "**Abraham de Moivre's Examination of Chance in the Game of Bassette**", which will be published in the Honors Program undergraduate research journal *Lucerna* in March 2025.

The following image in his paper is from de Moivre's *The Doctrine of Chances*, 1738, Problem XII, on Bassette, where the first column is the place number of the card and the last column is the multiplier of the stake as a win or loss.


Recent Faculty News

Dr. Qiao Zhuang joined UMKC this fall 2024 as an **Assistant Professor**, after working as a postdoctoral scholar at Worcester Polytechnic Institute. He received his PhD. in Mathematics from Virginia Tech.

His research interests include numerical analysis and scientific computing, as well as machine learning and data science. He has been working on finite element methods, especially for solving interface problems on unfitted meshes. He also works on meshless collocation methods, such as radial basis function methods. More recently, he is delving into scientific machine learning for PDEs, with particular interests in developing neural networks for multiscale and interface problems. He is passionate about extracting insights from classical numerical methods and integrating them into neural network frameworks to address complex and real-world problems. In his spare time, he likes reading and enjoys some outdoor activities.

Dr. Liana Sega had a research leave in Spring 2024 and she spent part of the semester in Berkeley, where she was a research member at the **Simons Laufer Mathematical Institute**, as part of the program in **Commutative Algebra** held there. She also spent in Berkeley two more weeks in the summer for a two-week research program, together with a diverse group of collaborators. [Pictured: the research group, and the view from her office in Berkeley]
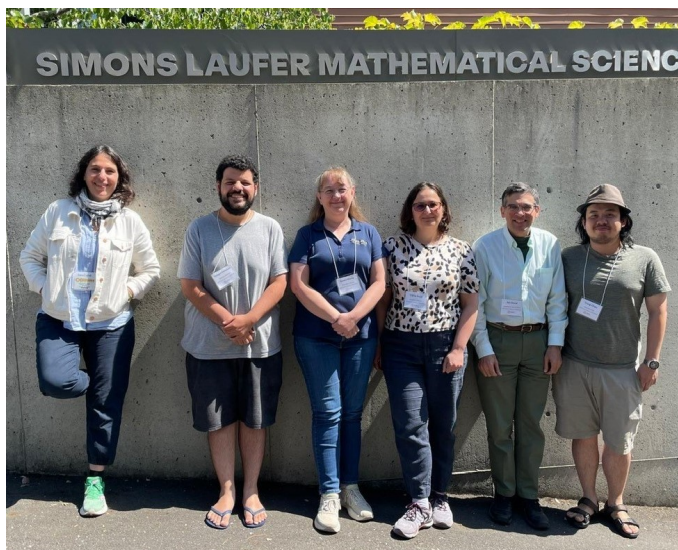
uate their usability and feasibility. Furthermore, a randomized clinical trial will be organized to determine the effectiveness of the developed systems. Following the successful development of the system, the team intends to apply for the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) grants offered by the National Institutes of Health (NIH).

Dr. Liu has been recently awarded a grant as the co-Principal Investigator from the Federal Emergency Management Agency (**FEMA**) to study local emergency management agency resource needs in the United States. Following the data collection for this research project, Dr. Liu will be leading the statistical modeling and analysis to reveal the factors that are significantly associated with resource constraints for local emergency management agencies throughout the United States.

Dr. John Sawatzky was out **backpacking through Europe** this summer, spending time in **France, Belgium, Germany, The Netherlands, Denmark**, and most notably hiking on the traditional pilgrimage trail St Olav's Way through central **Norway**. Now that he's back home John is excited to be doing math again, so feel very welcome to drop by his office if you have any kind of math questions or just want to share something cool! [The picture is outside Nidaros Cathedral at the end of his hike across Norway.]

Dr. Bowen Liu has been awarded two grants from UMKC: the **Faculty For Excellence grant** for $30k and the **Entrepreneurship Innovation Grant** for $46.3k, serving as one of the multiple principal investigators (MPI). Collaborating with colleagues from the School of Nursing and the School of Science and Engineering, Dr. Liu and the research team are set to develop multi-modal intelligent systems tailored for precision delivery of exercise-based interventions targeting lymphedema and lymphatic pain associated

with breast cancer. The project will involve collecting data from 30 healthy adults and 30 breast cancer patients to develop and refine system prototypes. Advanced machine learning techniques will be employed in the construction of these prototypes, while various statistical methods will be applied to eval-
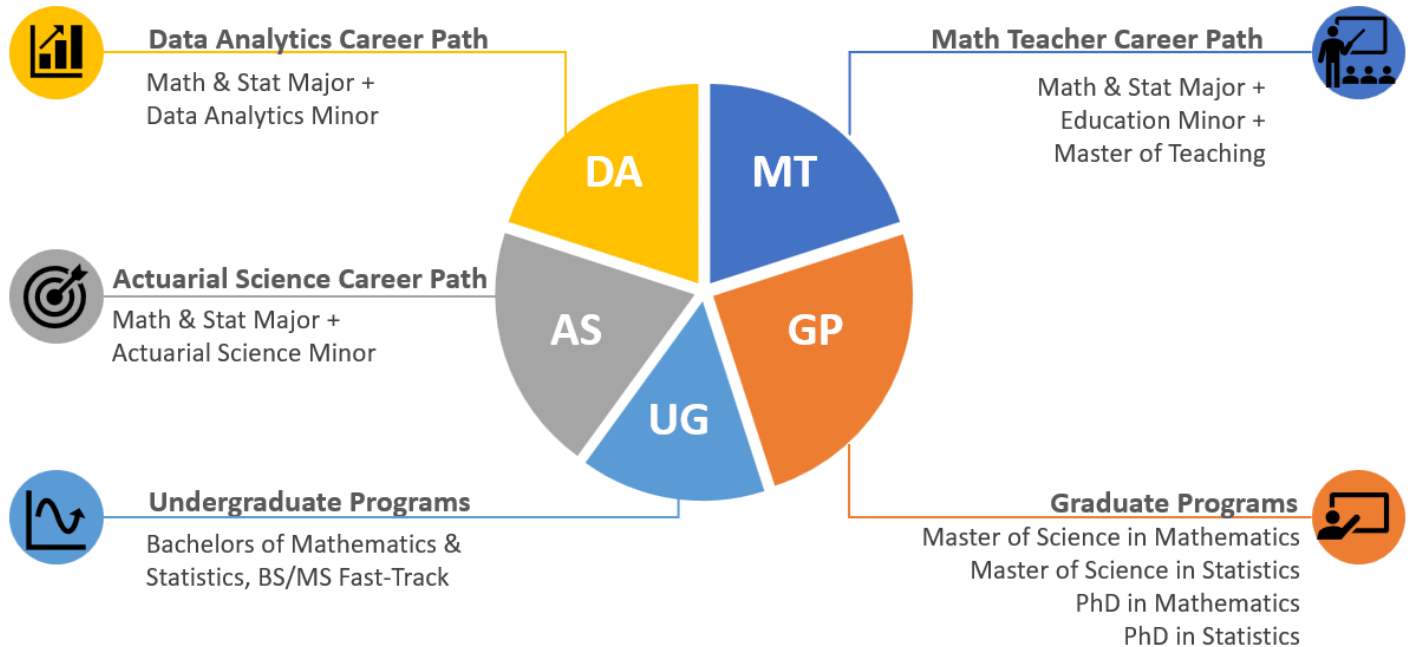
Math & Stat Fast Track programs

The Mathematics and Statistics fast track programs offer students an opportunity to meet the full requirements of the BS and MS in Mathematics and Statistics in a shorter time period than the separate degree programs.

UMKC Math & Stat Department

Graduate Programs, Undergraduate Programs, and Career Paths

Data Analytics Career Path
Math & Stat Major +
Data Analytics Minor

Math Teacher Career Path
Math & Stat Major +
Education Minor +
Master of Teaching

Actuarial Science Career Path
Math & Stat Major +
Actuarial Science Minor

Undergraduate Programs
Bachelors of Mathematics &
Statistics, BS/MS Fast-Track

Graduate Programs
Master of Science in Mathematics
Master of Science in Statistics
PhD in Mathematics
PhD in Statistics

Minor in Actuarial Science

Actuary job growth between 2018-2028 is expected to be about 20%, with a median salary of $102,880 per year, according to the Bureau of Labor Statistics. Actuary jobs were rated in 2019 in the top 10 jobs by Career-cast and have continually placed near or at the top of the rankings for the past 10 years. The minor in actuarial science prepares students for the first two actuary exams and provides them credit for validation by educational experience in accounting, economics, and statistics courses. The following diagram shows the career path in actuarial science. All UMKC students can add the actuarial science minor to their degree plan.

BEGIN

EXAM 1* Probability

EXAM 2* Financial Mathematics

Validation by Educational Experience (VEE)**
• Accounting and Corporate Finance
• Economics
** Typically completed while in school

HIRED NEW JOB!

# Student Organizations affiliated with Mathematics and Statistics

The purpose of the **UMKC Chess Club** is to provide a friendly environment in which its members may play, instruct, and discuss chess. The Chess Club will supply chess sets and clocks for its members. It also holds at least one open tournament annually, for all interested UMKC Students and future potential students. The Chess Club is dedicated to advancing chess by offering instruction to all UMKC students and future potential students.

Find out **Chess Club** meetings and activities here.

The **UMKC Math Club** promotes interactions between faculty and undergraduate students; provides math-related activities such as problem of the week, math movie nights, and math contests; invites math alumni and various employers to give insight into the current math job market; facilitates communication between math graduate and undergraduate students.

You can learn about **Math Club** meetings and activities here.
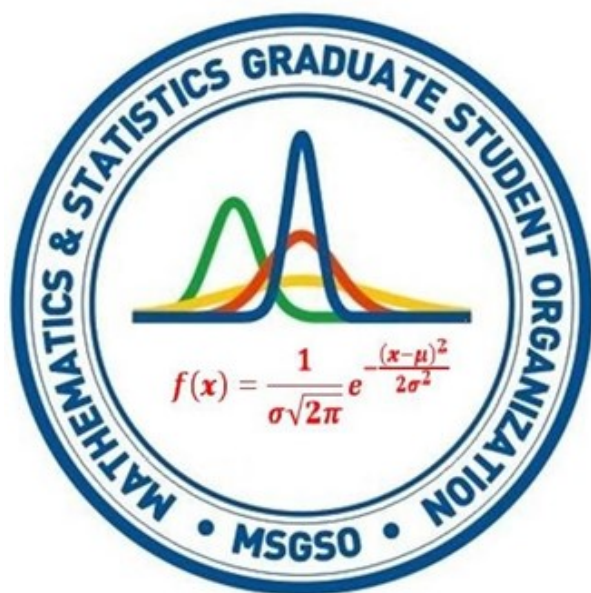
The purpose of **MSGSO** is to represent the graduate student body of the UMKC program of Mathematics and Statistics; to provide a forum for graduate student opinion; to act as a voice for the graduate students in matters of mutual interest to graduate faculty and students; and to promote professional interest and fellowship among the graduate students.

You can learn about **MSGSO** meetings and activities here.

Type address here or use Mail Merge
to automatically address this
publication to multiple recipients.
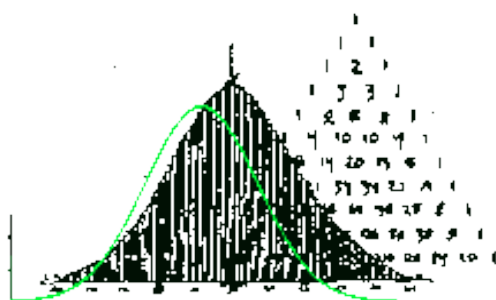
Visit our Website at **Mathematics and Statistics | Science and Engineering | University of Missouri - Kansas City**

Become a Member!

We encourage you to register as a member of the **UMKC Alumni Association**. Just go to the UMKC alumni website, click on the tab at the top of screen called "Connect & Volunteer", then on "My Profile/Logon", and follow the instructions.

If you would like to donate to UMKC, please visit the **UMKC Foundation** web pages where you will find links to Gift Planning, the Alumni Fund, creating a scholarship, and so on.

Our Mathematics and Statistics discipline is one of the few with **no dedicated scholarships for our undergraduate majors** and you might be the first to initiate one.

Send Us Your News!

We're always happy to hear from you. Send a paragraph or two and let us know what you have been up to. Pictures are welcome.
Please include your name and email address so we can contact you.

Send News to: Dr. Richard Delaware at delawarer@umkc.edu

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