2025 CONFERENCE

Science Coach®

PROFESSIONAL SKILLS BUILDING FOR
TEACHERS OF 6-12TH GRADE RESEARCH INSTRUCTION

June 17-19, 2025

University of Saint Mary

Leavenworth, Kansas

Welcome

JILL OTT
Science Coach
Chief Executive Officer

We're so excited to be gathering again this summer for our third annual Science Coach Academy! On behalf of our board of directors and staff, I extend a hearty and warm welcome!

We hope you fully embrace the offerings over the next few days and immerse yourself in this unique opportunity. Ask questions, take notes, seek and offer advice. Also, we encourage you to be curious - participate in a session or workshop that's not in your area of expertise. You have a robust menu to pick from, featuring an impressive roster of speakers who are leaders in their respective and varied fields. We're grateful to them for sharing their time and exceptional knowledge with us.

That's what this conference is all about - sharing, collaborating, and learning. And, that's what Science Coach is all about - creating a cohort of talented and dedicated teachers who share ideas and experiences, learning from and with each other. Underlying it all is our commitment to do everything we can to support you - to make it easy or you to lead and support students doing original research projects.

Now more than ever, the pursuit of knowledge and furthering of science discovery are so very critical, for young minds especially.

We know teaching research is hard, so we've built an ecosystem to support you - classroom materials, supplies, and specialized equipment, access to labs and mentors, ongoing training and development opportunities. Whether it's an emergency order for petri dishes, help with science fair paperwork, or connecting a student with a scientist to tap into their expertise, we've got you covered.

Your work in and out of the classroom has a lasting impact on the lives of your students. We applaud and ADMIRE your efforts. And we hope that through this conference and the year-long resources we provide, you see Science Coach as your *partner* in this vitally important endeavor of educating the next generation of STEM leaders!

We would like to thank the University of Saint Mary and the wonderful staff for their incredible hospitality and generosity. They truly made this year's conference possible. And I'm thrilled to share that we will be back here for next year's Academy! Mark the dates on your calendar - **June 23-25, 2026.**

A few last to-do's for the week:

- Connect with peers
- Pamper yourself at TLC Tuesday - where research teachers get the TLC they deserve!
- Check out the exhibitor booths
- Take advantage of free supplies in our Science Supply Room
- Lastly, provide us with feedback. Scan the ***In the Moment Feedback*** QR code. You'll also see it throughout the conference. We want to hear your thoughts, ideas and also your suggestions on what we can do better or differently next year. This is YOUR conference and we want to make sure you depart ENERGIZED AND ENRICHED!

In the Moment Feedback

And when you return to your classrooms in late summer, please let us know how we can help you to have a great school year.

Thank you again for joining us. We look forward to learning with you!

Jill Ott
CEO, Co-Founder and Inventor of Science Coach

P.S. For those of you not familiar with Science Coach and all that we do, check out our website **ScienceCoach.org.**

CONTENTS

University of Saint Mary

A special thank you to University of Saint Mary for the use of their facility.

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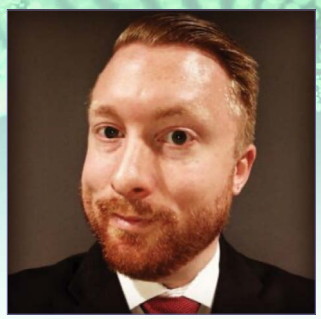

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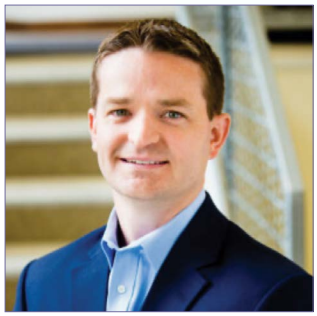

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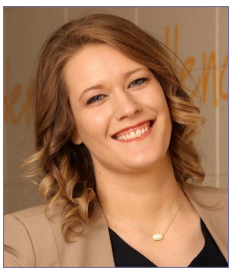


CAYLIE YESSA
Education & Outreach Coordinator

Conference Need to Knows

VIRTUAL OPTIONS & SESSION RECORDINGS

- **Virtual attendees** - Click this link for instructions and a list of sessions with their Zoom links.
- **In-person attendees** - Note which sessions are marked with a
  These sessions are being recorded and will be made available after the conference.

COMPLIMENTARY WIFI

- **Dorm** - USM-Play is both the network and password.
- **All other campus buildings** - USM-Guest is both the network and password.

SHARE YOUR IDEAS!

Please add your project ideas captured from sessions into the Google sheet accessible via the QR code. This will be a handy resource when you're helping students develop projects in the future.

PROJECT IDEAS

SCIENCE COACH STORE

Check out Science Coach branded apparel and merchandise in our store, located by the exhibitor booths in the KLC!

SAVE THE DATE

Next year's Science Coach Academy is June 23-25 at University of Saint Mary.

NEED ASSISTANCE? Call or Text:
Shawn Morris - 314.779.7799
Jennifer Hess - 636.387.2480

SOCIAL MEDIA

Stay in touch with the Science Coach Academy and other attendees throughout the conference and use
#Academy2025
to join the conversation

@ScienceCoach.Org
@ScienceCoachOrg
ScienceCoach
ScienceCoachOrg

Earn Graduate Credit!

LINDENWOOD UNIVERSITY

Earn 1 graduate credit from Lindenwood University for attending The Science Coach Academy, or you can earn 2 graduate credits for attending and writing a 5-page analysis paper.

To earn the credit you will need to complete an application available at the conference registration desk and submit it to Lindenwood University.

If you need any assistance with enrollments | grades | transcripts | timelines, please visit www.lindenwood.edu (PACE Frequently Asked Questions/Academic Terms), or email Lindenwood at pace@lindenwood.edu.

Conference Schedule Overview

MONDAY

Check In for Pre-Conference Attendees, Presenters, Exhibitors
4-6 pm - Miege Hall, Entryway

Dinner
6-7 pm - Saint Joseph Dining Hall

TUESDAY

Breakfast
6:30-8:30 am - Saint Joseph Dining Hall

Check In for Pre-Conference Attendees
8-9 am - Miege Hall, Entryway

Pre-Conference Workshops
9-11:30 am - Miege Hall

Lunch
11:30 am- 12:30 pm - Saint Joseph Dining Hall

Pre-Conference Workshops Continue
12:30-4 pm - Miege Hall

Science Supply Room Open
4-5 pm - Miege Hall, Room 101

Check In for Main Conference Attendees
3-5 pm - Miege Hall, Entryway

Dinner
5-6 pm - Keleher Learning Commons ALC (Center Room)

TLC Activities
6-8 pm - Keleher Learning Commons ALC (Center Room)

WEDNESDAY

Breakfast
6:30-8:30 am - Saint Joseph Dining Hall

Check In for Main Conference Attendees
7-8 am - Miege Hall, Entryway

Welcome & Introductions
8-8:50 am - Keleher Learning Commons, ALC (Center Room)

Morning Sessions
9-11:30 am - Miege Hall

Lunch
11:30 am- 12:30 pm - Saint Joseph Dining Hall

Afternoon Sessions
12:30-4:45 pm - Miege Hall

Dinner & "The Sweet Science of Chocolate"
5-7 pm - Saint Joseph Dining Hall

Science Supply Room Open
7-9 pm - Miege Hall, 101

THURSDAY

Breakfast
6:30-8:30 am - Saint Joseph Dining Hall

Check Out
7-8 am - Miege Hall, Entryway

Science Coach Introduction
8-8:50 am - Keleher Learning Commons, ALC (Center Room)

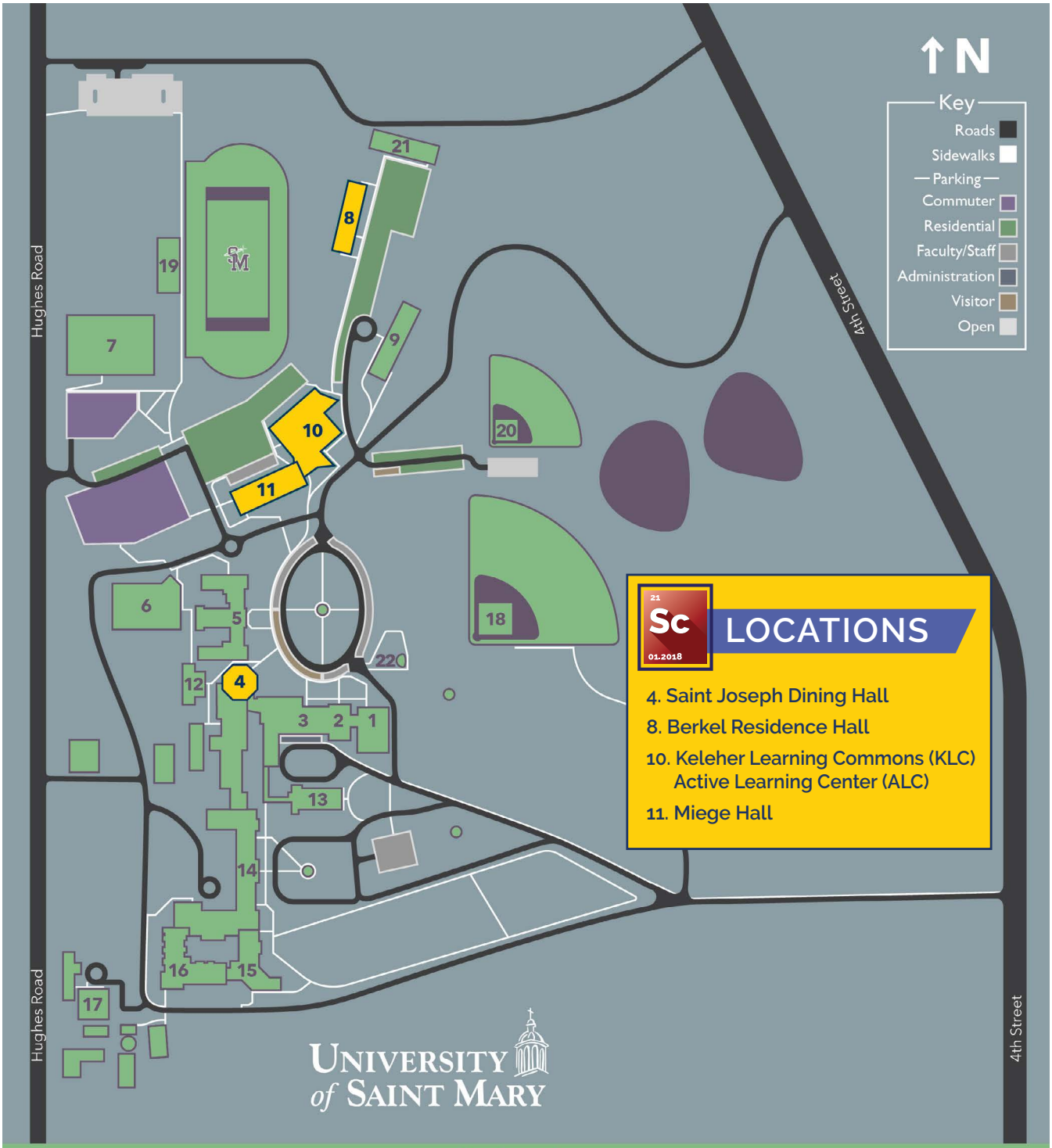
Morning Sessions
9-11:30 am - Miege Hall

Lunch
11:30am- 12:30 pm - Saint Joseph Dining Hall

Afternoon Sessions
12:30-4:45 pm - Miege Hall

Conference Concludes, Final Check Out
4:45-5 pm - Berkel Hall

University of Saint Mary Campus Map



Key Locations

1. Xavier Hall
2. Saint Mary Hall
3. Mead Hall
4. Saint Joseph Dining Hall
5. Berchmans Hall
6. Ryan Sports Center
7. McGilley Field House
8. Berkel Residence Hall
9. Maria Residence Hall
10. Keleher Learning Commons
11. Miege Hall
12. Cantwell Hall
13. Annunciation Chapel
14. SCL Mother House
15. Marillac Center
16. Ross Hall
17. Brooder House
18. Baseball Field
19. Berkel Memorial Stadium
20. Softball Field
21. Steele Residence Hall
22. Saint Mary Grotto

Daily Schedule

TUESDAY, JUNE 17

Breakfast
6:30-8:30 AM - Saint Joseph Dining Hall

Registration - Check In for Pre-Conference Attendees
8-9 AM - Miege Hall, Entryway

Pre-Conference Workshops
9-10 AM - Miege Hall
- Plant-Bacterial Symbiotic Relationships - Room 308
- The Soul-Warming Science of Yeast Breads - Room 106, Ministry Kitchen

Break - Refreshments Provided by USM Nursing Division
10-10:15 AM - Keleher Learning Commons

Pre-Conference Workshops continue
10:15-11:30 AM - Miege Hall

Lunch
11:30 AM - 12:30 PM - Saint Joseph Dining Hall

Pre-Conference Workshops continue
12:45-2:30 PM - Miege Hall

Break - Refreshments Provided by USM Admissions Department
2:30-2:45 PM - Keleher Learning Commons

Pre-Conference Workshops continue
2:45-4 PM - Miege Hall

End of Pre-Conference Workshops
4 PM

Check In for Main Conference Attendees
3-5 PM - Miege Hall, Entryway

Science Supply Room Open
4-5 PM - Miege Hall, Room 101

Visit Exhibitor Booths and Science Coach Store
4-8 PM - Keleher Learning Commons

Dinner
5-6 PM - Keleher Learning Commons, ALC (Center Room)

TLC Tuesday
6-8 PM - Keleher Learning Commons

Pre-conference

TUESDAY, JUNE 17

1 Plant-Bacterial Symbiotic Relationships

Dr. Siva Sankari, *Assistant Investigator, Stowers Institute*
Miege Hall, 308

9 AM – 4 PM

This is an interactive session focusing on techniques involved in studying plant-bacterial interactions. Participants will have the opportunity to take part in multiple guided experiments focused on culturing the soil bacterium, Sinorizobium meliloti. Throughout will be lessons on proper sterile procedures, experimental design considerations, importance of biological nitrogen fixation in agriculture and how to implement newfound knowledge to students.

2 The Science of Yeast Breads

Angela Smith, *Founder, Inquisicook Culinary Science*
Miege Hall, 106 - Ministry Kitchen

9 AM – 4 PM

This is a day-long, hands-on exploration of the science of the breadmaking process- comparing yeast types and forms, the function of kneading, ideas for research offshoots, and the sensory evaluation of baked breads.

3 TLC Tuesday - Rest, Reflect, Reignite

Keleher Learning Commons

6 – 8 PM

- 5 Self-Care Stations - Make your own tea, bath salts, snack pack, and ice cream sundae.
- Cadaver Lab Tour
- Lebeau Special Collection Exhibit Tour

Daily Schedule

WEDNESDAY, JUNE 18

Breakfast
6:30-8 AM - Saint Joseph Dining Hall

Registration - Check In for Main Conference Attendees
7-8 AM - Miege Hall, Entryway

Science Supply Room Open
7-8 AM - Miege Hall, Room 101

Visit Exhibitors Booth and Science Coach Store
7:30 AM-3 PM - Keleher Learning Commons

Welcome & Introductions
8-8:50 AM - Keleher Learning Commons, ALC (Center Room)

Morning Sessions - #1
9-10 AM - Miege Hall
- Immunologic Essays in Biological Research - Room 105
- Monarch Butterfly-Based Projects - Room 106

Break - Refreshments Provided by USM Center for Peace and Justice
10-10:30 AM - Keleher Learning Commons

Morning Sessions - #2
10:30 -11:30 AM - Miege Hall
- Writing Scientific Research Papers - Room 105
- Precision Agriculture - Room 106

Lunch
11:30 AM- 12:30 PM - Saint Joseph Dining Hall

Afternoon Sessions - #1
12:30-2:30 PM - Miege Hall
- Mammalian Cell Culture Techniques - Room 308
- Science of Popcorn - Room 106, Ministry Kitchen

Break - Refreshments Provided by USM Teacher Natural Science And Mathematics Division
2:30-2:45 PM - Keleher Learning Commons

Afternoon Sessions - #2
2:45-4:45 PM - Miege Hall
- Tiny Earth Program Overview - Room 105
- Hands on Statistical Analysis - Room 106
- Basic Circuitry and Breadboarding - Room 205

Dinner & Special Program
5-6 PM - Dinner, Saint Joseph Dining Hall
6 PM - "The Sweet Science of Chocolate"

Science Supply Room Open
7-9 PM - Miege Hall, 101

WEDNESDAY, JUNE 18

SESSION 1 9 - 10 AM (SELECT ONE)

Immunologic Assays in Biological Research

Dr. Erik Barton, *Research Fellow, Pfizer*
MIEGE HALL, 105

The exquisite specificity of the mammalian antibody response has enabled the generation of numerous assays to detect protein expression, protein conformation and modification, and the interaction of proteins with other key biochemical molecules. These assays are frequently used in biomedical research due to their speed and sensitivity. However, because antibodies must be generated and manufactured using bioprocesses that can have unpredictable outcomes, antibody-dependent assays require careful design and relevant controls to ensure the resulting data are useful. We will review the major immunologic assays (including western blots, ELISA, immunostaining, and immunoprecipitation, among others), discuss key pitfalls that can render these assays difficult to interpret, and outline strategies for successful design and interpretation of your immunoassays.

Monarch Butterfly Based Projects

Dr. Kristen Baum, *Director of Monarch Watch; Senior Scientist, Kansas Biological Survey; Professor, Department of Ecology and Evolutionary Biology at the University of Kansas*
MIEGE HALL, 106

Monarch Watch is dedicated to the conservation of Monarch butterflies. Learn how your students can participate in research involving Monarchs, from citizen science projects to designing individual research projects.

SESSION 2 10:30 - 11:30 AM (SELECT ONE)

Precision Agriculture

Dr. Derek Tesser, *Research Scientist, Remote Sensing Lab at Saint Louis University*
MIEGE HALL, 106

Anthropogenic land cover changes, shifting climates, and extreme weather events are increasingly impacting ecological systems, including forests and agriculture, with significant consequences for the carbon and water cycles. To effectively understand the ecological processes driving these changes and respond to critical impacts—such as disease outbreaks, droughts, and floods—accurate and timely information is crucial. However, monitoring large areas in near-real time using field-based approaches presents significant challenges. Remote sensing, the science of collecting environmental information from a distance via satellites or drones, offers a powerful solution. These advanced technologies have become increasingly accessible, marking a golden age for remote sensing. New tools and methodologies are enhancing and augmenting traditional in situ analyses. This session explores the technologies and capabilities of remote sensing, focusing on drones and satellites for ecological applications such as agriculture. It highlights common measurements that can be linked to and scaled with remote sensing technologies and previews the next generation of sensors poised to advance Earth observation science.

WEDNESDAY, JUNE 18

SESSION 2 10:30 - 11:30 AM

Writing Scientific Research Papers
Dr. Teresa Boman, *Professor of Biology and Environmental Health, Director of the Environmental Health and Safety Program, Missouri Southern State University; State Co-Director of Missouri Junior Academy of Science*
MIEGE HALL, 105

Scientific writing can be daunting. It is technical, it is brief, it is concise and sometimes it does not feel fun (most of the time). The goal of scientific writing is not to entertain, but to inform. In this presentation, we will discuss how to make this process less painful in order to make sure the value of the research is not lost in a poorly written paper.

2-HOUR HANDS-ON WORKSHOPS

SESSION 3 12:30 - 2:30 PM (SELECT ONE)

Mammalian Cell Culture Techniques
Dr. Yan Wang, *Scientist I from the Cells, Tissues, and Organoids Center of Stowers Institute*
MIEGE HALL, 308

In this session, Dr. Wang will introduce the concept and definition of cell culture and the applications of cell culture. With the progress of cell culture technology, beside the traditional 2D cell culture, multiple new cell culture systems have emerged, such as 3D organoids and organ-on-chips. Those will also be introduced in the session. In the meanwhile, Dr Wang will demonstrate the procedures of cell culture, including thawing, passaging, and cryopreserving the cells by presenting with the actual manipulation of cell culture in CTOC at Stowers. As one of the key elements of cell culture, the contamination types and how to avoid contamination in cell culture will also be covered in the session.

Science of Popcorn
Angela Smith, *Founder, Inquisicook Culinary Science*
MIEGE HALL, 106 - MINISTRY KITCHEN

Who doesn't love popcorn? This delicious hands on workshop investigates different types of corn, coatings, toppings, cooking methods, etc. There is a LOT of science involved in popcorn!

WEDNESDAY, JUNE 18

SESSION 4 2:45 - 4:45 PM (SELECT ONE)

Tiny Earth Program Overview
Mariah A. Knowles, *Curriculum Lead, Tiny Earth at the University of Wisconsin-Madison*
MIEGE HALL, 105

Tiny Earth addresses two pressing challenges: antibiotic resistance and a diverse STEM workforce. Tiny Earth is a global CURE with 800+ trained instructors in 33 countries. The goal of the network is to discover new antibiotics from soil bacteria and encourage diverse students to persist in STEM. The flexible curriculum costs no more to implement than a traditional microbiology course lab and focuses on hypothesis-driven research skills. The companion instructor training (a week-long immersive, facilitated institute at UW-Madison) is based on scientific teaching practices and AJEDI principles. This presentation will provide an overview of the Tiny Earth curriculum: what Tiny Earth students ("Tiny Earthlings") do, how they are engaged in research, and how students disseminate their findings. And although Tiny Earth is aimed at undergraduates, we will also share lessons learned by partner instructors who have adapted Tiny Earth for high school and community college. After the presentation, come find Mariah at the Tiny Earth table to pick up supply lists and talk more!

Basic Circuitry and Breadboarding
Lydia Spoor, *High school physics and engineering teacher, Holt High School; Adjunct Instructor, Maryville University and Saint Charles Community College*
MIEGE HALL, 205

Do your students want to do projects that involve electricity but you don't know the difference between a volt and an amp, or how to measure them? Do you think a breadboard is something found in the kitchen? If so, this is the session for you! You will be taught how to decode the mysterious symbols of a circuit diagram, how to measure values used in common electronic applications, and how to build and prototype simple circuit elements.

Hands on Statistical Analysis
Dr. Mary "Katie" Kilmer, *Associate Professor of Biology and Environmental Health, Missouri Southern State University; State Co-Director, MO Jr. Academy of Science*
MIEGE HALL, 106

In this session, participants will work with actual data sets to carry out statistical analyses. Participants will work through the process of selecting the correct statistical test, running the test (with software) and interpreting the final results, including making figures.

WEDNESDAY EVENING DINNER & SPECIAL PROGRAM 5 – 7 PM

The conference dinner will allow for networking with fellow attendees and presenters. The evening will be capped off with a special food science demonstration, "The Sweet Science of Chocolate," at which dinner guests will learn about how chocolate is made, taste test the different varieties of chocolate, and sample delicious truffles!

Daily Schedule

THURSDAY, JUNE 19

Breakfast
6:30-8 AM - Saint Joseph Dining Hall

Check Out and Room Key Return
7-8 AM Miege Hall, Entryway

Science Supply Room Open
7-8 AM - Miege Hall, Room 101 (LAST CHANCE FOR SUPPLIES)

Science Coach Introduction
8-8:50 AM - Keleher Learning Commons, ALC (Center Room)

Morning Sessions - #1
9-10 AM - Miege Hall
- AI in Research - Room 105
- Cybersecurity 101 - Room 106

Break - Refreshments Provided by USM Teacher Education Program
10-10:30 AM - Keleher Learning Commons

Morning Sessions - #2
10:30-11:30 AM - Miege Hall
- Experimental Design - Room 105
- Basic Bioinformatics - Room 106

Lunch
11:30 AM-12:30 PM - Saint Joseph Dining Hall

Afternoon Sessions - #1
12:30-2:30 PM - Miege Hall
- Analyzing Research Papers and Posters - Room 106
- DIY Cell Culture in the Classroom - Room 302
- Techniques in Field Research - Room 308

Break - Refreshments Provided by USM Division of Business & Information Technology
2:30-2:45 PM - Keleher Learning Commons

Afternoon Sessions - #2
2:45-4:45 PM Miege Hall
- Using Arduino in Student Projects - Room 205
- Plant Tissue Culture in the Classroom - Room 302

Conference Concludes & Final Check Out
4:45-5 PM - Berkel Hall

THURSDAY, JUNE 19

SESSION 1 9 - 10 AM (SELECT ONE)

AI in Research

Chris Bethel, *Entrepreneur and cancer researcher*
MIEGE HALL, 105

Since their launch in late 2022, large language models like ChatGPT have revolutionized the knowledge economy, rapidly transitioning from skepticism to essential tools across data-driven industries. In education, these models are emerging as transformative assets, capable of enhancing workflows, personalizing learning, and fostering critical thinking when implemented thoughtfully.

Cybersecurity 101

Sunny Sun, *Associate Professor in Cybersecurity, University of Saint Mary*
Aaron Weissenfluh, *Chief Operating Officer, Tenfold Security*
MIEGE HALL, 106

This session will cover terms used in the field of Cybersecurity (including CIS and IT) and will provide an overview of the broad skills needed by cybersecurity professionals. Topics will include discussion of technologies and practices used for preventing cyberattacks or mitigating their impact. Session attendees will learn about how Cybersecurity professionals work to protect computer systems, applications, devices, data, financial assets and people against ransomware and other malware, phishing scams, data theft, and other cyberthreats.

SESSION 2 10:30 - 11:30 AM (SELECT ONE)

Basic Bioinformatics

Dr. Claudia C. Preston, *Assistant Professor, Biology Department at St. Mary's University of Minnesota; Co-founder and Educational Director of Young STEM Scholars; Science Coach Virtual Teacher*
MIEGE HALL, 106

What is it, and can I do it? This session will provide teachers with an introductory overview of data analysis pipelines, data query searches, open-source databases and in silico webtools available for starting bioinformatics projects with students. The main goal of this session is for teachers to be familiar and comfortable utilizing various online resources and bioinformatics tools to answer complex biological questions. You are not required to have coding skills, just basic knowledge of biology and basic computer skills.

Experimental Design (statistics based)

Dr. Mary "Katie" Kilmer, *Associate Professor of Biology and Environmental Health, Missouri Southern State University; State Co-Director, MO Jr. Academy of Science*
MIEGE HALL, 105

In this session, participants will learn how to properly design and set up a research project, to ensure that data analysis is easy! Participants will discuss hypothesis formulation, predictions, planned statistical testing, replication, controls, variables and treatments, etc…

THURSDAY, JUNE 19

2-HOUR HANDS-ON WORKSHOPS

SESSION 3 12:30 - 2:30 PM (SELECT ONE)

Analyzing Research Papers and Posters
Dr. Teresa Boman, *Professor of Biology and Environmental Health, Director of the Environmental Health and Safety Program, Missouri Southern State University; State Co-Director of Missouri Junior Academy of Science*
Dr. Mary "Katie" Kilmer, *Associate Professor of Biology and Environmental Health, Missouri Southern State University; State Co-Director, MO Jr. Academy of Science*
MIEGE HALL, 106

Explore what makes research papers and posters "good" or "bad" by looking at real examples and evaluating them with actual competition judges who can tell you what to look for.

DIY Cell Culture in the Classroom
Jennifer Hess, *Supervisor of Coaches & Training, Science Coach*
MIEGE HALL, 302

Participants will learn to make a still air box to do sterile tissue culture in. Each participant will make a box to take home. Participants will also learn the basics of setting up their lab for plant tissue culture at school.

Techniques in Field Research
Wendy Parrett, *Curriculum Coordinator, Missouri Department of Conservation*
MIEGE HALL, 308

This session will take teachers through common techniques and equipment used in soil, water, and forestry projects.

SESSION 4 2:45 - 4:45 PM (SELECT ONE)

Using Arduino in Student Projects
Lydia Spoor, *High school physics and engineering teacher, Holt High School; Adjunct Instructor, Maryville University and Saint Charles Community College*
MIEGE HALL, 205

Do you want to know how to automatically open a door when someone approaches, control a robotic arm with a joystick or remotely log weather data over a period of time? The Arduino is an ideal microcontroller for students wishing to complete projects where inputs need to be read and then outputs determined based on predetermined rules. This workshop will give you hands-on experience using an Arduino to complete simple tasks such as turning on a light or taking a distance reading with a motion sensor. You will also explore the extensive online Arduino maker community and resources that exist for students looking to use an Arduino in their research.

Plant Tissue Culture in the Classroom
Jennifer Hess, *Supervisor of Coaches & Training, Science Coach*
MIEGE HALL, 302

Participants will make plant tissue culture media, sterilize explants, and set up tissue culture with a plant of their choice, then get to take their babies home!

Science Coach Academy Presenters

Dr. Erik Barton

Erik Barton received his PhD in Microbiology & Immunology from Vanderbilt University in 2000, with his thesis focused on understanding the molecular mechanisms of virus tropism in vivo and the biophysical interactions that enable tissue-specific virus targeting. After postdoctoral studies at Washington University in St. Louis, he spent eight years studying viral pathogenesis and immunity to chronic infections as an NIH-funded faculty member at Purdue University and Wake Forest University.

Session: Immunologic Assays in Biological Research: Avoiding Common Pitfalls in Assay Design

Dr. Kristen Baum

Dr. Kristen Baum is the Director of Monarch Watch, Senior Scientist with the Kansas Biological Survey, and Professor in the Department of Ecology and Evolutionary Biology at the University of Kansas. Monarch Watch is an education, conservation, and research program that focuses on the monarch butterfly, its habitat, and its spectacular fall migration. Her research interests focus on the effects of land use, management practices, and climate change on monarchs and other pollinators. She has served on numerous state, regional, national, and international working groups to support monarch and pollinator conservation efforts. Dr. Baum is actively involved with efforts supporting STEM education, facilitating student research, and making science accessible to the general public.

Session: Projects Using Monarch Butterflies

Chris Bethel

Chris Bethel, an entrepreneur and cancer researcher, has been leveraging AI tools since their inception. With extensive experience presenting on AI across the St. Louis area, he collaborates with organizations to integrate AI effectively into their practices.

Session: AI in Research

Dr. Teresa Boman

Dr. Teresa Boman Professor of Biology and Environmental Health, Director of the Environmental Health and Safety Program, Missouri Southern State University; Co-Director of Missouri Junior Academy of Science

Dr. Teresa Boman earned her Ph.D. in Environmental Sciences from Arkansas State University in 2012 and has been teaching at MSSU for 12 years. In addition to teaching, she volunteers as the regional co-director for the Missouri Junior Academy of Sciences (Southwest region) and the state co-director for the Missouri Junior Academy of Sciences competitions. She enjoys research and is currently focused on microplastics in Missouri's waterways. When not at work, she likes to spend time with her four kids and husband on the family farm and taking vacations.

Sessions:
- Writing Scientific Research Papers
- Analyzing Research Papers and Posters

Jennifer Hess

Jennifer taught high school AP biology, anatomy, and science research for 26 years prior to coming to Science Coach. In that time, she took numerous students to state, national, and international science competitions and experienced success at all levels. She is currently the director of the Missouri Tri County Regional Science and Engineering Fair, and co-director of the Missouri Junior Academy of Science-St. Louis regional competition. In her spare time, she loves all things plants and gardening, as well as caring for her chickens, and cooking and baking.

Sessions:
- Classroom Plant Tissue Culture
- DIY Cell Culture in the Classroom - Building a Still Air Box

Dr. Mary "Katie" Kilmer

Dr. Mary K. (Katie) Kilmer is an Associate Professor of Biology and Environmental Health at Missouri Southern State University. She also serves as the regional co-director for the Missouri Junior Academy of Sciences (Southwest region) and the state co-director for the Missouri Junior Academy of Sciences. She enjoys the challenge of making daunting topics, such as statistics, more accessible and enjoyable for all. In her free time, Dr. Kilmer enjoys reading, spending time with her family, and tending to her beehives.

Sessions:
- Experimental Design (statistics based)
- Hands-on Statistical Analysis
- Analyzing Research Papers and Posters

Science Coach Academy Presenters

Mariah A. Knowles

Mariah A. Knowles is the Curriculum Lead for Tiny Earth at the University of Wisconsin-Madison. A self-described "Swiss army knife," she brings a wealth of experience and expertise to the Tiny Earth community, including a decade of experience in teaching, curriculum design, and AJEDI. Her research stands on two pillars, (a) clarifying emerging social concerns for curriculum and instruction, grounded in the experiences of real practitioners, and (b) advancing mixed methods data science for telling rich qualitative stories supported by quantitative features.

Session: Introduction to the Tiny Earth Program

Wendy Parrett

Wendy Parrett is a Curriculum Coordinator with Missouri Department of Conservation. She works with the preK-12 grade Discover Nature Schools program, creating science-based lessons with schoolyard phenomena. Her education background is in environmental education, curriculum and instruction.

Sessions: Techniques in Field Research

Dr. Claudia C. Preston

Dr. Claudia C. Preston is a physician scientist with more than 16 years of experience in biomedical research and bioinformatics and currently appointed as an Assistant Professor in the Biology Department at St. Mary's University of Minnesota. At SMU she teaches a variety of courses ranging from upper division courses, as well as human biology introductory courses in English and Spanish. Her academic research program at SMU focuses on utilizing advanced bioinformatics with open source web tools to answer biological questions, primarily related to infertility, polycystic ovarian syndrome (PCOS) and overall female health. Dr. Preston is also Co-Founder and Educational Director of a STEM-outreach research company called Young STEM Scholars, with programs designed for high school students to aid them in the development of their scientific writing and research skills, including communication and engagement of the audience within the research community. She has mentored over two dozen trainees to date, with post-baccalaureate mentees that have gone onto successful careers as physician assistants, clinical research assistants, and scientific researchers. Her post-secondary students have competitively applied for scholarships and research opportunities, securing educational grants, full tuition scholarships and Department of Defense funding for their work.

Session: Basic Bioinformatics

Dr. Siva Sankari

Siva Sankari, Ph.D., a biochemist, microbiologist, and plant biologist, joined the Stowers Institute in 2023 as an Assistant Investigator. Dr. Siva Sankari's research focuses on the beneficial interactions between plants and microbes. Through the Sankari Lab, she and her team develop innovative tools and methodologies to study the action of peptides on bacteria, leveraging these insights to better understand their biological functions. Current research efforts are aimed at improving human health and advancing agricultural practices by harnessing the physicochemical properties of these peptides. Her work has the potential to contribute to a variety of applications, including clinical treatments, biotechnology, bioremediation, and sustainable agriculture. Dr. Savi Sankari holds a PhD from the University at Buffalo, NY, and has served as a Research Scientist in the Department of Biology at the Massachusetts Institute of Technology (MIT), Boston. With a strong commitment to making STEM education accessible to all, Dr. Sankari actively participates in and organizes initiatives aimed at fostering inclusivity and broadening access to scientific learning. Her work is driven by a passion for creating educational opportunities that empower individuals from diverse backgrounds to engage with and excel in STEM fields.

Sessions:
- Plant-Bacterial Symbiotic Relationships

Science Coach Academy Presenters

Angela Smith

Angela Smith is the founder of Inquisicook Culinary Science and is a homeschool veteran of over 30 years. She's on a mission to bring STEM education into the kitchen, turning curious students into intuitive cooks—not just recipe followers. Mrs. Smith lives near Athens, Georgia, with her husband of 34 years. She enjoys all aspects of outdoor exploration and can often be found in the forest foraging for wild foods, photographing tiny creatures, and enjoying the beauty of nature.

Sessions:
- The Soul-Warming Science of Yeast Breads
- The Science of Popcorn
- The Sweet Science of Chocolate

Sunny Sun

Sunny Sun is an Associate Professor in Cybersecurity at the University of Saint Mary. He teaches courses on networking, web design, programming languages, operating systems, data structures, and database design. He also creates tutorials on his YouTube page and is currently pursuing his doctorate in cyber security.

Session: Cybersecurity 101

Lydia Spoor

Lydia Spoor has taught high school physics and engineering for 17 years at both Ritenour and Holt High School. She received her MA in physics from Washington University, where her research focused on the development of aluminum based metallic glasses. She is an adjunct instructor at Maryville University, sponsors her school's chapter of the Technology Student Association, and has been a competition coordinator at both the state and national level for TSA. She was also the Missouri TSA sponsor of the year in 2024.

Sessions:
- Basic Circuitry and Breadboarding
- Using Arduino in Student Projects

Dr. Derek Tesser

Dr. Derek Tesser is a Research Scientist in the Remote Sensing Lab at Saint Louis University. Before joining SLU, he spent 15 years in New York City, where he was a founding faculty member of a community college within the City University of New York system, developed STEM curricula, and created study abroad programs for students to explore Ecuador's biodiverse rainforests. Derek's research focuses on environmental remote sensing, using drones and satellites to study land cover changes for forestry, agriculture, and biodiversity conservation. He has over a decade of field experience in South America's tropical forests, vineyards across the U.S., and conducting agricultural inventories in Europe. Currently, Derek collaborates on NASA's upcoming NISAR mission as part of the ecosystem science team and is developing a wetland experimental site in the Amazon. A St. Louis native, Derek is excited to have recently returned home to cheer on his favorite team, the Cardinals.

Session: Precision Agriculture

Dr. Yan Wang

Yan Wang, Ph.D. is a Scientist I from the Cells, Tissues, and Organoids Center of Stowers Institute for Medical Research with more than ten years of experience working with cell culture.

Dr. Wang specializes in mammalian cells, insect cells, and fish cell culture, stem cell differentiation, organoids derivation, and lentivirus transduction. Dr. Wang uses her positive attitude and tireless energy to encourage others in the workplace. Dr. Wang is inspired daily by her husband and her daughter. In her free time, Dr. Wang likes to read, work out and cook Chinese food.

Session: Mammalian Cell Culture Techniques for the Classroom

Aaron Weissenfluh

Aaron Weissenfluh, the Chief Operating Officer of Tenfold Security, has over 20 years of experience in security and executive leadership. He has held the position of Chief Information Security Officer (CISO) for leading financial companies, Cboe and American Century. A veteran entrepreneur, Aaron has successfully launched multiple startups and is skilled at creating security programs from scratch for large organizations. His extensive experience and innovative approach to cybersecurity strengthen Tenfold Security's ability to provide top-tier protection for its clients.

Session: Cybersecurity 101

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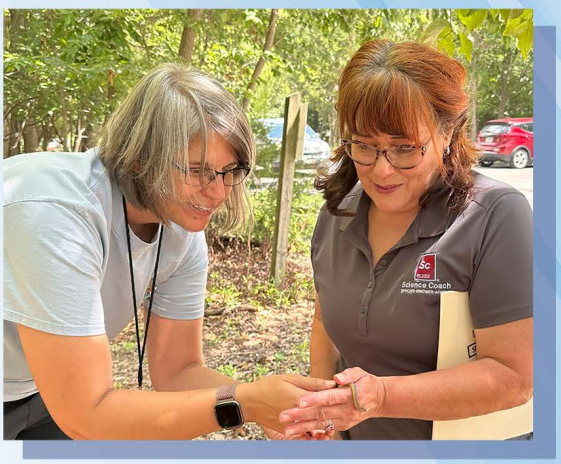

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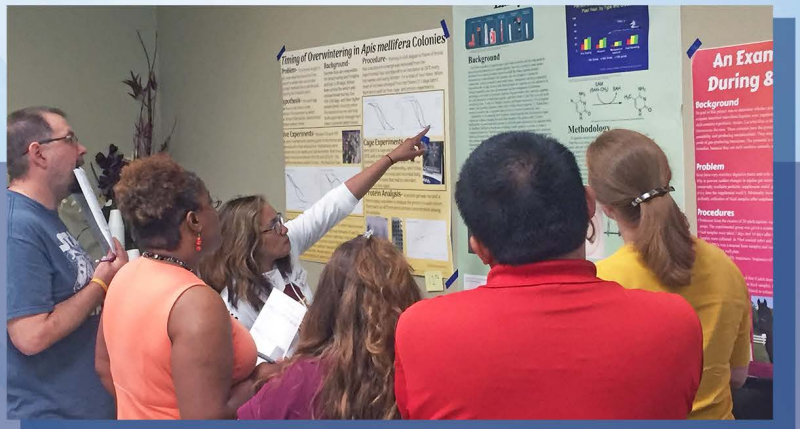

Join or Learn More about Science Coach

Local Stores/Services

(within 5 miles of University of Saint Mary)

Below is a list of convenient locations you may need during your stay at USM.

Walmart Supercenter – has a pharmacy
(2 miles from USM)
5000 10th Ave, Leavenworth, KS 66048
(913) 250-0182

Dillons – grocery & has a pharmacy
(1.5 miles from USM)
720 Eisenhower Rd, Leavenworth, KS 66048
(913) 250-3500

CVS Pharmacy
(1 mile from USM)
390 Limit St, Leavenworth, KS 66048
(913) 651-2323

Walgreens Pharmacy
(1 mile from USM)
2900 S 4th St, Leavenworth, KS 66048
(913) 651-2027

St John Hospital – has an emergency room
(.5 mile from USM)
3500 S 4th St, Leavenworth, KS 66048
(913) 680-6000

NextCare Urgent Care – walk-ins welcome
(4 miles from USM)
1100 N 4th St, Leavenworth, KS 66048
(888) 381-4858

Quik Trip – gas station
(1.5 miles from USM)
1205 N Main St, Lansing, KS 66043
(913) 565-9147

NOTES

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Since 2007, the Science Coach non-profit has been engaging diverse 6th-12th grade students to experience completing a scientifically accurate research project that solves a problem important to them. We work through schools to intentionally upgrade research teachers' skills, providing extensive professional development and a comprehensive support ecosystem that results in 89% of the students choosing STEM careers.