



2020 MATHCOUNTS West Alabama Regional Competition

Program highlights:

- Built on last year's success (see pictures at <https://mathcounts.ua.edu/mathcounts-2019.html>), we have gained continuing support from the University of Alabama (UA) Division of Community Affairs and the Tuscaloosa City School District.
- We will organize the competition among about seven local middle schools, which is a historically high participation rate in math competitions. We thank the recruiting help from the Tuscaloosa City School District, Dr. Daria and Mr. Kenneth Webb.
- We hope to provide the best experience to the students and coaches. Students will receive free T-shirts and goodie bags. Lunch, catered by Chick-fil-A, will be provided to the mathletes and coaches. Small gifts will be presented to the coaches.
- The winning teams will receive MATHCOUNTS trophies for their school. Individual awards will be given to each grade level (thanks to the generous sponsorship from the UA Division of Community Affairs and local organizations).
- STEM demos will be staged after the math competition and award ceremony. Multiple laboratories in the College of Engineering at the University of Alabama will showcase their cutting-edge research in robotics, advanced materials, electric cars, smart sensing, etc.
- The program schedule is listed on the next page. Visit <https://mathcounts.ua.edu/> for details.

2020 MATHCOUNTS West Alabama Regional Competition is sponsored by:



Division of
Community Affairs



College of
Engineering





Subject: MATHCOUNTS West Alabama Regional Competition: Competition Day Feb 22, 2020

Coaches: Please pass the following information on to your students and their parents, as well as any assistant coaches.

Location: SERC-1013 (South Engineering Research Complex)

College of Engineering, University of Alabama

Address: 255 7th Ave, Tuscaloosa, AL 35487

The Competition will be held in the SERC, Room 1013 (Please note that this is the updated location). A map is attached to this email to show the competition venue, SERC building, and the parking lot. Parking is free on the competition day.

Date and Time:

February 23: 8:00 am to 4:30 pm

Registration begins at 8:00 and students must be in their seats to take the Written Competition in SERC-1013 at 9:00 am.

What to Bring for the competition:

Coaches: Please bring all the signed Photo-Video Release forms, if you have not sent them in.

Students should bring several sharpened pencils and a calculator (the one without a QWERTY keyboard). Scratch paper will be provided. Mathletes should pack snacks and a bottle of water.

Arrival Instructions for Coaches and Mathletes:

Coaches and mathletes need to pick up the registration package in SERC1014.

Arrival Instructions for Parents and Other Guests:

Parents may wait in the lobby area or return for the Countdown Round (12:30 pm) and Awards Ceremony (1:30 pm). Parents will not be allowed in the testing room during the Written Competition or breaks.

Lunch: Lunch will be provided to coaches and mathletes. Parents may buy lunch from the food court at Ferguson Center (3-min walking distance from SERC).

Schedule: The competition day schedule is attached. We encourage parents to attend the Countdown Round and Award Ceremony.

Mathletes will have opportunities to see STEM demonstrations from multiple university research labs after the written competition at 2:30 pm.



2020 MATHCOUNTS West Alabama Regional Competition

Date: February 22, 2020

Time: 8:00 am to 4:30 pm

Venue: SERC building Room 1013, College of Engineering, University of Alabama
(Note this is the updated location, see the attached map)

Address: 255 7th Ave, Tuscaloosa, AL 35487

Program Schedule

8:00-8:50 am: Registration-- SERC-1014

9:00-9:50 am: Sprint Round-- SERC-1013

10:00-10:30 am: Target Round-- SERC-1013

10:40-11:10 am: Team Round-- SERC-1013 and 1014

11:10 am-12:30 pm: Lunch-- SERC-1014

12:30-1:30 pm: Countdown Round-- SERC-1013

1:30-2:30 pm: Awards Ceremony-- SERC-1013

2:30-4:30 pm: STEM Demonstrations--South Engineering Research Center (SERC)

2020 MATHCOUNTS West Alabama Regional Competition is sponsored by:



Division of
Community Affairs



College of
Engineering



STEM Demos

Electrical vehicles and charging stations (SERC 1042)

Dr. Can Kisacikoglu, Electrical and Computer Engineering

Demo Contact: Emin Ucer, eucer@crimson.ua.edu, Tel: 205-523-6494

Electric vehicles (EVs) are increasing in numbers in our lives. There are more than a million EVs in the United States alone, and this number is fast increasing. We research mass EV connection to the utility power grid without any power disruption in the grid. We will show you a real Nissan Leaf EV demo and some charging equipment.

Concrete demo (SERC 1009)

Dr. Armen Amirkhonian, Civil, Construction, and Environmental Engineering

Demo contact: Atolo Tuinukuafe, Tel: 206-823-9220

Description: Concrete is the most used man-made material in the world! There are many types of concrete used for sidewalks, roads, buildings, and airfields. Come learn about concrete and make your own concrete coaster out of a special concrete mixture that is used to rapidly patch civilian and military airfields! You'll be able to take the coaster home with you.

3D optical scanning of fingerprint (SERC3055)

Dr. Yu Gan, Electrical and Computer Engineering, Email: ygan6@eng.ua.edu; Tel: 201-290-1184

Contact: Shengting Cao, scao7@crimson.ua.edu

We will explain how to use an optical imaging modality, namely optical coherence tomography (OCT), to capture depth-resolved bio-structure. We will demonstrate an example of using OCT to perform 3D scanning of human's fingerprint.

Temperature-driven color change of aqueous polymer solutions ((First-floor lobby area, SERC)

Dr. Zhao, Chao, Chemical and Biological Engineering,

Contact: czhao15@eng.ua.edu; Tel: 234-738-6082

Demonstrate the color change of an aqueous polymer solution when adjusting temperature from 0 to 25 °C (room temperature). Explain the temperature-driven phase transition of polymer chains.

Eco-Car (First-floor lobby area, SERC/Engineering Quad)

Dr. Hwan-Sik Yoon, Mechanical Engineering, hyoon@eng.ua.edu

Demo Contact: Derek Hooper <djhooper@crimson.ua.edu>

Underwater autonomous vehicles (First-floor lobby area, SERC)

Dr. Aijun Song, Electrical and Computer Engineering

Demo Contact: Qiang Fu and Hahnemann Mondal

Underwater robots are powerful tools to explore the lakes and the oceans. We will show multiple types of underwater robots and explain how these robots are used in the research. Young visitors will have a chance to test the control of these vehicles and watch the demo video.

Software-defined radar (First-floor lobby area, SERC)

Dr. Sevgi Gurbuz, Electrical and Computer Engineering

Demo Contact: szgurbuz@eng.ua.edu

Radars have a wide range of applications. Here we demonstrate the latest usage: using Radars to monitor human walking and extract useful information about a person's movements (speed, gaits, etc).

Astrobotics demonstration (First-floor lobby area, SERC)

Dr. Kenneth Ricks, Electrical and Computer Engineering

Demo Contact: "Cora Kangas" cmkangas@crimson.ua.edu

Bioinspired Terrestrial Soft Robots (First-floor lobby area, SERC)

Dr. Vishesh Vikas, Mechanical Engineering

Contacts: Michael Maynard

Wireless Charging (First-floor lobby, SERC)

Dr. Seongheon Nathan Jeong, Electrical and Computer Engineering

PARKING LOT



**MATHCOUNTS
VENUE**

