2023 UALR Pre-College Diversity Engineering Program
ENGINEERING OLYMPICS
JUNIOR DIVISION RULES AND REGULATIONS
Middle School

COMPETITION STRUCTURE:

The competition is open to any 6th, 7th, and 8th grade students attending school (including home school) in Arkansas.

The competition is free to any 6th, 7th, or 8th grade student registered in a UALR Pre-College Diversity Engineering Program (PCDEP) Club or any student who participated in a DCSTEM summer program. All other participants are required to pay an entry fee of $5 per student. Fees charged will be based upon the number of names submitted on each school's roster form. No more than three (3) teams of ten (10) students each from the same school may participate in the 2023 Engineering Olympics.

No more than 10 members per Engineering Olympics team. The minimum number of students needed to comprise a team is four (4). Sponsors (teachers) will be required to submit the names of all participants prior to the event by completing a team registration form. The alternate can participate on the day of the event only if one of the other registered members cannot attend. Team members are to be selected either by volunteering or through a selection process, which is determined by the sponsor (teacher).

The competition will consist of 3 events: Quick Stop Racer Competition, Critical Thinking Problems, and the Free-Standing Structure Competition. UALR will supply all materials, except as noted in the rules and regulations.

COMPETITION DETAILS:

General Description

Each school will select members to participate in the 3 events. Each team member must participate in at least one of the three events. Each team must follow the instructions for each event. No exceptions will be allowed.

General Rules

A. A team consists of a maximum of ten members plus one alternate. A team can be as small as four (4) members. The maximum number of participants per event is as follows:
   - Quick Stop Racer Competition Up to 3 students
   - Critical Thinking Problem Up to 4 students
   - Free Standing Structure Competition Up to 3 students

B. Each school is allowed to have no more than three (3) teams entered in the Engineering Olympics.
C. Pre-fabrication of devices will be allowed per individual event guidelines.
D. In the event of a tie, there will be a special seven question quiz bowl between the teams. Each team will be permitted to have up to three team members on their quiz bowl team.
E. Due to the necessity of pre-fabrication work, teams will be required to pre-register using the registration form on page 7 prior to receiving their materials (Quick Stop Racer Competition materials).
F. Sponsors must bring a competition list at the registration table on the day of the event. The competition list is a document which is contains the names of each student and what event they will compete in. Once this list is provided at registration, there can be no substitutions.
G. Good sportsmanship will be observed at all times.
H. At least two adults are recommended to accompany each participating team.
I. The decision of the judges is final.

Safety Rules

A. All devices must use only the materials as prescribed by the rules and supplied for that particular device/event. Use of materials not permitted by the rules will result in the disqualification of the team from the event.
B. The judges will monitor/inspect construction of all devices as necessary during the event.
C. Participants should follow the directions of the event official at each event.

Eligibility Requirements
All student teams are required to pay a registration fee of $5 per student. Students who participated in a DCSTEM summer program are not required to pay a registration fee. These fees are necessary to ensure teams are committed to participating in the event.

Individual Event Guidelines/Scoring

Quick Stop Racer Competition

Objective: To calibrate the braking system of a wooden car such that given a stopping distance the car will stop without exceeding that stopping distance.

Resources: A kit will be provided to each participating team. The kit will consist of all the materials necessary to make two (2) complete cars along with all of the instructions and tips used to build the models and calibrate the braking system.

The kit will include the following:

2 – Main Bodies
4 – Nylon Bearings
2 – Fins
6 – Wing Nuts
4 – Rear Wheels (1.5” diameter)
8 – Hex Nuts
4 – Front Wheels (1.75” diameter)
2 – Threaded Rods
2 – Pusher Props
2 – Laser-cut Wrenches
2 – Rubber Motors
4 – Laser-cut Front End Side Plates
2 – L-hooks
2 – Front End Plates
2 – 1/8” Diameter Wooden Axles
4 – Rubber Bands
2 – Red Tubes
2 – Sets of Assembly Instructions/Guide

Regulations:

1. Teams must only use the materials in the kit to build their car. Teams may elect not to use all of the materials provided.
2. Teams will be required to calibrate their car's braking system such that when they arrive for the competition, the car will stop at the prescribed distance.
3. Each team will be permitted to conduct two (2) runs.
4. The surface which will be used on the day of the competition will be a laminate wooden floor.
5. The maximum distance that a car will be required to travel will be 35 feet.
6. On the day of the event, teams will be informed of the stopping distance.
7. Cars can be placed on the starting line as long as the front wheels do not extend beyond the front of the starting line.
8. The front wheels of the car must not exceed beyond the finish line.
9. The distance from the front wheels of the car to the finish line will be measured for each run. 10. Once the stopping distance is announced, teams will have five (5) minutes to make their adjustments in the pit area.
11. After the adjustment time is over, all teams are to place their cars at the starting line staging area 12. When a team is called, one team member retrieves the car from the staging area and places the car at the starting line. Team members will be given time to wind their motor.
13. All measurements made by the event officials are final.
14. After completing the first run, team members may return to the pit area to make any adjustments, if needed.
15. Additional calibration work may be performed between runs. However, teams failing to arrive (at the starting line) on time for the run will forfeit their run.
16. The better of the two runs will be counted for final scoring.
17. The measurements taken by the event judges are final.

Scoring:

1. Points will be awarded to the six that stop closest to the finish line without going past the finish line. Ten (10) points will be awarded to the first place team, with 8, 6, 4, 2, 1 points respectively being awarded to second through sixth place.
2. The weight of the car will break any ties, with the lighter weight car breaking the tie.
3. Should a car brake past the finish line on both runs, the team will be disqualified (receive no points) from this event.

Critical Thinking Problems

Objective: To analyze and solve word problems using mathematical and possibly science concepts within a specified time period (30 minutes).

Resources:

8-1/2" x 11" standard copier paper/ruled paper (supplied by UALR)
Pencils (supplied by UALR)
Graph paper (if needed, supplied by UALR)
Ruler or straight edge (supplied by UALR)
Calculator (**NOT** supplied by UALR)

Regulations:
1. Each team will sit at a table/as a group together.
2. A brief review of the rules for judging/scoring will be given.
3. Team members may consult each other.
4. Pencils and all necessary materials will be given to each team member. It is highly recommended that one member from each team bring their own calculator for familiarity purposes. Each team is allotted no more than one calculator per team member. 5. The problem will be handed out to each team face down. Three copies of the problems will be handed out to each team.
6. At the instructions of the event official, the problems will be turned over. 7. The event official will read the problems aloud once.
8. The time to solve the problems (30 minutes) will begin after the event official has read all of the problems.
9. Students may not ask anyone in attendance or event officials any questions once the event official has completed reading the problems.
10. A representative from each team must bring the problems to the event official. The judges will review the answer and inform the team (via its representative) only which answers are correct.
11. Students should present their solutions in a **clear** form and show their work to prevent the judges from being confused as to whether the students guessed to arrive at their answer. 12. If all of the answers are deemed correct, the team members must remain quiet for the remaining time so as to not disturb the remaining contestants.
13. If the solutions presented are not correct, the team has one more opportunity to present correct answers before being eliminated from competition.
14. Teams will be allowed two opportunities to present their results to the judges. If a team still has an incorrect answer after presenting their results a second time, they will not be allowed to complete the problem and try to receive credit for a correct answer a third time. However, such a team can receive points (second through sixth place) provided the remaining teams are unable to provide correct answers for second through sixth place.

Scoring: Points will be awarded for first through sixth place (10, 8, 6, 4, 2, 1 points respectively). The first team to provide the judges with the most correct answers and proofs in the shortest amount of time will be awarded first place points. Second place will be awarded to the second team with the most correct answers and proofs in the second shortest amount of time, and so on. The decision of the judges is final.

In case of a tie, judges will select a winner based upon clarity and neatness of presented work.

Free-Standing Structure Competition

Objective: To work together to construct the tallest free-standing structure given specific engineering design obstacles with a specified time period.

Resources:
To be determined on the day of the event, and supplied by UALR.

Regulations:

1. Each team will sit at a table together.
2. All materials will be placed on the table. Teams will not be permitted to touch the materials until the event official signals that the event has started. Should a team touch the materials prior to the start of the event, they will be disqualified.
3. Teams not competing will be sequestered until it is their opportunity to compete. 4. Once the head event official indicates the start of the event, students will be able to start building their structure.
5. At prescribed times, the head event official will issue commands that will simulate engineering and design obstacles. Judges will watch to ensure compliance with the commands. All teams will have the same obstacles.
6. After 8 minutes, judges will measure the height of the structure using a ruler. Measurements will be taken from the top of the table to the highest point on the structure. 7. Any touching of the structure after the 8 minute construction period is over may result in a team being disqualified.
8. It will be the responsibility of the student teams to ensure the proper measurement is noted by the judges.
9. Structures falling down prior to the official measurement being taken will not be measured. Each team will have a judge nearby to take measurements.
10. Each team will receive new pipe cleaners to work with.
11. After all teams have completed the event, judges will award points based upon height with the tallest structure being first.
12. Should there be a tie for any position, teams will each receive an equal portion of the available points. For example, two teams tying for first place will each receive 9 points (sum of the first and second place points divided by two) with the next award going to the third place team. If three teams are tied for third place, each team will receive 4 points (sum of the third through fifth place points divided by three).
13. The decision of the judges is final.

Scoring: Points will be awarded for first through sixth place (10, 8, 6, 4, 2, 1 points) for the six tallest structures.

OVERALL COMPETITION SCORING

- Points will be awarded from 1st– 6th place in each event as described under event descriptions.
- Team points will be tabulated at the end of the day.
- Medals will be awarded to the 1st (Gold Medal), 2nd (Silver Medal), and 3rd (Bronze Medal) place participants in each individual event.
- In the event of a tie, there will be a special seven question quiz bowl between the teams.
- Each team will be permitted to have up to three team members on their quiz bowl team.

2022 UALR Pre-College Diversity Engineering Program Engineering Olympics presented by Garver – Junior Division Information Sheet

When? February 18, 2023 from 9:00 a.m. until 2:30 p.m.

Where? EIT Building at University of Arkansas at Little Rock

How many students can attend? No more than ten students can attend. As few as four students can participate as a team.

How do I register a team? Mail or e-mail (krharris@ualr.edu) the team registration form and participant information forms to UALR no later than February 1, 2023. Sponsors must include the names of all team members and a mailing address for the kit. T-shirt sizes must also be included (s, m, l, xl, xxl), as UALR will distribute prior to the event. Teams registering after February 1, 2023 will not be guaranteed t-shirts and will lose valuable pre-fabrication time.
*Once a team's **registration form** is received, the sponsor will receive materials.* Registration fees may be paid at any time including the day of the event.

What is the schedule of events?

Registration - 9:00 a.m. – 9:45 a.m. (EIT Building 1st Floor)

Welcome – 9:55 a.m.
Critical Thinking Problem – 10:15 a.m. (EIT 321 & EIT 322)
Quick Stop Racer Competition – 10:30 a.m. (EIT Auditorium)
Lunch Break – 11:45 a.m. (approx. time)
Free-Standing Structure Competition – 1:15 p.m. (EIT Auditorium)
Awards – 2:15 p.m. (EIT Auditorium)

What do I bring the day of the event?

1. Calculators – four (for each member of the Critical Thinking Problems team)
2. Batteries (for calculators)
3. Quick Stop Racer
4. Competition List – List of students competing in each event
5. Participant Information Forms
6. Payment for team (checks payable to UALR)

Where will students be allowed to eat?

There are a variety of places to eat on and near campus. The Trojan Cafeteria in the Donaghey Student Center will also be open.

What about parking?

All lots will be available for parking (gates will be up). Lot 8 (parking lot adjacent to EIT Building) will be open. See attached map for parking locations. School buses should park in Lot 13.

Questions? Contact Keith Harris at 916-6290 or krharris@ualr.edu

Team Registration Form

PRE-COLLEGE DIVERSITY ENGINEERING PROGRAM

Engineering Olympics (Jr. Division)
February 18, 2023

Please complete appropriate items below:

Our school (**will**) participate in the 2023 Engineering Olympics on **February 18, 2023**

Names of Students (*please print*) T-shirt size (s, m, l, xl, xxl – adult sizes)

1.)

2.)

3.)

4.)

5.)

6.)

7.)

8.)

9.)

10.)

Alternate:

_____ _____

Sponsor/School Sponsor/School _____

School Mailing Address: _____

Please mail/e-mail this reply form before **February 3, 2023** to:
UA Little Rock Engineering Olympics
Donaghey College of Science, Technology, Engineering, and Mathematics
2801 S. University Avenue
ETAS Room 125
Little Rock, AR 72204
Attn: Keith Harris
Fax: 501-916-6290; e-mail: krharris@ualr.edu

UA Little Rock

College of Science, Technology, Engineering, and Mathematics

Outreach Participant Information Form

Student Information:

Last Name:_____ First Name:_____ MI: _____

School Name: _____ Current Grade: _____

Date of Birth: _____ Gender: F M Expected Graduation Year: _____

Ethnicity:

American Indian/Alaskan Native Asian/Pacific Islander
Puerto Rican Black/African American Hispanic/Latino
Caucasian/White Other: _____

Street Address: _____Apt: ____ City:

_____ State: _____ Zip Code: _____

Phone: _____ Student email address: _____

Intended Major: _____

What is your primary career interest at this time (circle one):

Engineering
Business
Other Math Related Field
Computer Programming
Health Field
Other Science Related Field
Don't Know
Other: _____

Adult T-shirt Size (circle one): Small Medium Large XL 2XL

Parent/Legal Guardian Information:

Name: _____

Email Address: _____

Work Phone: _____ Cell Phone: _____

I give my permission for UA Little Rock to use my photograph in UA Little Rock press releases.

Student Signature _____Date_____ Parent Signature _____ Date _____

Engineering Olympics Competition List

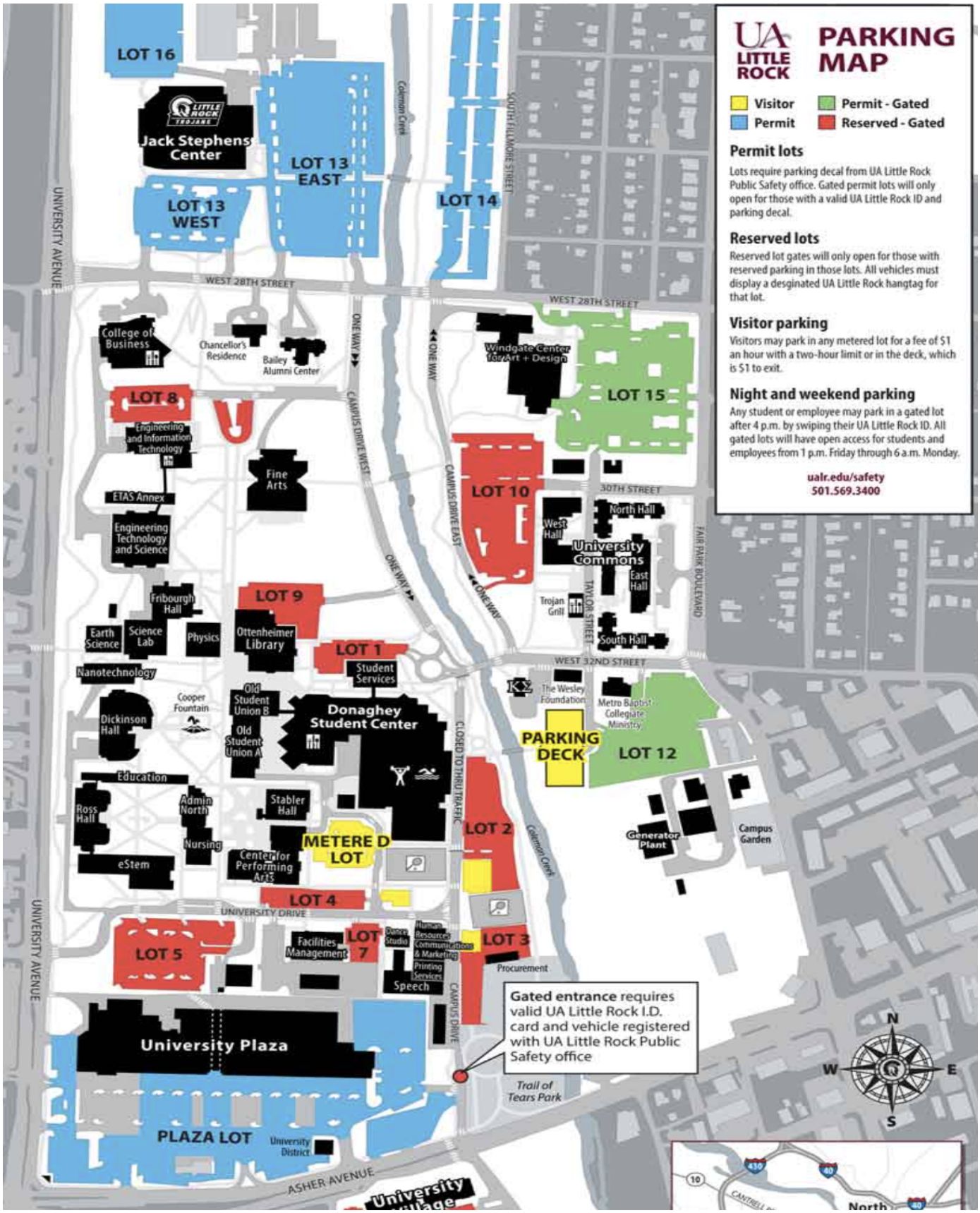
This form must be turned in at the registration table on February 18, 2023

School: _____

Team Number (if more than one team from the same school, i.e., A, B, C): _____

Instructions – **Print** the names of your students competing in each event listed.

Quick Stop Racer Competition	No more than 3 students
Critical Thinking Problem	No more than 4 students
Free-Standing Structure Competition	No more than 3 students


UA LITTLE ROCK
PARKING MAP
Visitor
Permit
Permit - Gated
Reserved - Gated
Permit lots
Lots require parking decal from UA Little Rock Public Safety office. Gated permit lots will only open for those with a valid UA Little Rock ID and parking decal.
Reserved lots
Reserved lot gates will only open for those with reserved parking in those lots. All vehicles must display a desginated UA Little Rock hangtag for that lot.
Visitor parking
Visitors may park in any metered lot for a fee of $1 an hour with a two-hour limit or in the deck, which is $1 to exit.
Night and weekend parking
Any student or employee may park in a gated lot after 4 p.m. by swiping their UA Little Rock ID. All gated lots will have open access for students and employees from 1 p.m. Friday through 6 a.m. Monday.
ualr.edu/safety
501.569.3400
LOT 16
Jack Stephens Center
LOT 13 EAST
LOT 13 WEST
LOT 14
UNIVERSITY AVENUE
WEST 28TH STREET
College of Business
Chancellor's Residence
Bailey Alumni Center
LOT 8
Engineering and Information Technology
ETAS Annex
Engineering Technology and Science
Fine Arts
ONE WAY
CAMPUS DRIVE WEST
CAMPUS DRIVE EAST
Windgate Center for Art + Design
LOT 15
LOT 10
30TH STREET
North Hall
West Hall
University Commons
East Hall
Trojan Grill
South Hall
TAYLOR STREET
FAIR PARK BOULEVARD
Fribourgh Hall
Earth Science
Science Lab
Physics
LOT 9
Ottenheimer Library
LOT 1
Student Services
Nanotechnology
WEST 32ND STREET
The Wesley Foundation
Metro Baptist Collegiate Ministry
Cooper Fountain
Old Student Union B
Old Student Union A
Donaghey Student Center
Dickinson Hall
PARKING DECK
LOT 12
Education
Ross Hall
Admin North
Stabler Hall
Nursing
eStem
Center for Performing Arts
METERE D LOT
LOT 2
CLOSED TO THRU TRAFFIC
Colemon Creek
Generator Plant
Campus Garden
LOT 4
UNIVERSITY DRIVE
LOT 5
Facilities Management
LOT 7
Dance Studio
Human Resources Communications & Marketing
Printing Services
Speech
LOT 3
Procurement
CAMPUS DRIVE
Gated entrance requires valid UA Little Rock I.D. card and vehicle registered with UA Little Rock Public Safety office
University Plaza
Trail of Tears Park
PLAZA LOT
University District
ASHER AVENUE
University Village
N
W
E
S
North