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Unknown Mission Challenge

Mission tasks are totally unknown until the day of competition.
Robots are built and programmed at the competition.

Special Scholarship Competition

November 4, 2023 1:00 pm ~ 5:00 pm

At Lawrence Technological University

Computer Science Robofest Lab, J234 (building 8)

www.robofest.net

robofest@ltu.edu

248-204-3568

Room J233 Taubman Complex, LTU
21000 West 10 Mile Road, Southfield, MI 48075, USA

1. UMC Special Scholarship Competition Overview

Learning Objectives:

- Autonomous navigation
- Critical thinking
- Computer programming logic
- Use of sensors
- Adjusting to environmental conditions
- Problem solving
- Learning on the fly
- Design and construction of robots

Synopsis:

- Competition for individual High School Students
- Winner will be awarded a \$17,000 Annual Scholarship to LTU, renewable for 4 years for a total of \$68,000*
- Mission tasks will be totally unknown until the day of competition
- The goal of this challenge is to provide an opportunity to develop problem-solving skills on the fly without any help from adult coaches

* Student must meet LTU Admissions requirements, and maintain a minimum of 12 credit hours per semester and 3.0 GPA

2. Age Divisions and Team Size

- Senior Division: (Grades 9-12)
- Team Size: Individual Students Only
- Registration Fee: \$25
- Student must bring the signed [Robofest Consent and Release Form](#) on the day of the event, if not completed on-line

3. Robot Requirements

- Students may only use one of the following approved robot platforms, and must bring their own robot parts
 - LEGO NXT sensors, motors, parts, and one NXT controller
 - LEGO EV3 sensors, motors, parts, and one EV3 controller
 - LEGO SPIKE Prime/Robot Inventor and one SPIKE Prime/Robot Inventor Controller
 - VEX IQ sensors, motors, parts, and one VEX IQ controller
- No limit to part quantities, except for the limit of one controller
- Pre-assembled robots cannot be used
- All robot components must be unassembled at the beginning of the competition
- Sensor or motor multiplexers are not allowed
- Any programming language is allowed and student must bring their own computer to program the robot
- No internet or cell phone use allowed

4. Allowed/Not Allowed

Allowed

- Robot Kit – All parts disassembled
 - LEGO NXT
 - LEGO EV3
 - LEGO SPIKE Prime/Robot Inventor
 - VEX IQ
- Computer
- Programming software
- Multiple programs
- Measuring tape/stick

Not Allowed

- Pre-assembled robots
- Starting jigs
- Build Instructions
- Multiplexers

5. Competition Procedures

- Only participants are allowed in the work area, at pit tables, and around game fields throughout the competition day
- The Unknown Mission Challenge is unveiled at the start of the event. No adult help is allowed after the unveiling
- Participants must share the practice fields and are limited to one practice run at a time if other teams are waiting
- Team ID must be visible on the robot
- Robots will be impounded at the end of the work time
- Students will have “official” runs that will be judged
- Winners will be decided based on the scoring of their individual runs
- The exact method of determining final scores will be unveiled at competition

6. Preparation

Although everything is built and programmed at the UMC competition, there are still some things that students can do to help prepare.

Useful Skills

- Math/operations using robot
- Displaying values
- Following a line or an edge of a table
- Measuring distances using rotation sensor
- Measuring the distance to an object using a distance sensor
- How to use gears
- Converting rotations or degrees to mm or inches
- Measuring time
- Counting
- Using variables to store/recall information

Recommended Sensors/Parts

- Color/light sensors (at least 2)
- Rotation sensor (part of the motor, but know how to use them)
- Touch sensor
- Distance sensor
- Enough motors for a robot base and a manipulator (robot arm)

7. Workshop

- A free workshop has been scheduled for registered students to prepare for the competition with VEX IQ robot kits and VEXcode IQ
- Students who attend the UMC workshop may borrow a VEX IQ robot kit for the competition on November 4
- **Workshop: Sat, Oct 21, 2023, 1:00 PM ~ 5:00 PM**
At Lawrence Technological University, Computer Science Lab, J234 (building 8)