Music City BEST Kick Off Day – September 21, 2019

8:00 – 9:00 **Doors Open & Registration at Allen Arena – View the Game Field**

9:00 – 10:30 **Welcome**
Music City BEST General Information
Game and Rules
Question & Answer Session on Game and Rules

10:30 – 11:00 **Experience the Playing Field**

10:30 – 12:00 **Pick up Kits – in front of Allen Arena, cars can drive up to this location**

11:00 – 1:00 **Break for Lunch (on your own) – Check out our Student Center**

	Room 209 Fields Engineering Center	Room 211 Fields Engineering Center	Room 205 Fields Engineering Center
1:00 to 3:00	**IR Sensor Workshop** **Sam Wright**	**Marketing & Notebook Tips** **Jeff Cohu & Mary Metelko**	**VEX Control System** **Greg Nordstrom**
	Theory of operation for BEST IR Sensor, assembly instructions, testing and adjustment of the system.	Interactive session to learn marketing techniques such as presentation, speaking, storytelling and active listening. Also discussing notebook development.	This workshop will provide an introduction & overview of the VEX controls. It will explain how these components and controls work and how to use them in your robot.
3:00 to 4:00	**Room 103** **Soldering Workshop** **LU IEEE Student Chapter**	**Room 211** **Coaches Meeting** **Mary Metelko**	
	Learn how to solder thru-hole components and practice on discrete components.	Meet new team coaches, identify team assistance needs, review season changes, open discussion	

OFF THE GRID – 2019 Game Summary

With over 200,000 miles of high-voltage transmission lines and over 5.5 million miles of local distribution lines, across the USA, disruptions are inevitable. Disaster areas are extremely dangerous due to live high voltage wires that have fallen to the ground and the existence of substantial debris. Working with robots, the new generation of linemen will act as pilots/drivers and interact with the robot by loading payloads and equipment to be installed on the grid.

Game Objective:

Design and build a robot capable of working with a lineman to perform the following power grid rebuilding tasks:

- Clear debris from roadways and dispose of the debris safely.
- Re-attach power lines to transmission line towers and residential poles.
- Install residential transformer(s).
- Install substation transformer(s)
- Install electrical conduit in underground trenches.
- Transport transmission line insulators to linemen in the field

Game Field:

Four quadrants of the game field represent the 4 power grids in North America (Eastern, Western, Texas-ERCOT and Quebec). Two sets of 3-phase 345 KV high voltage transmission power lines cross down the middle of the field. Branching off the center transmission tower (or transfer tower), 3-phase 138KV distribution lines route the power toward conduit trenches. Power substations at this point will down convert the distribution power levels to 13KV for the 3 conduit pipes in each trench using substation transformers. Power is routed around neighborhoods using 4KV single phase power lines. Residential transformers are used to step down the voltage to 120V for the homes. The game starts with all aspects of the power grid destroyed and debris littering the field.

Game Pieces:

Three types of transmission lines are waiting to be re-installed by the team robots. 345KV transmission lines are found at three different heights, with the lowest level being owned by teams (color-coded). Upper two lines can be claimed by any team that makes the first power segment connection. 138KV distribution lines are available for teams to attach to any distribution tower. 4KV residential lines are laying across the houses in their color-coded quadrant waiting to be re-attached. Underground conduit available in the team equipment stores area can be transferred to the robot by the lineman for installation into the quadrant conduit trenches. Color-code transformer skids are available on the field loaded with substation and residential transformers. Ground debris must be cleared to reach several areas around the field. Spare tower insulators are available in the equipment stores area and can be delivered to power substations using an autonomous driving period to gain high value points.

Game Scoring:

- Clear ground debris and disposal (20 or 30 pts)
- Connection of residential lines (30 pts) and conduit trenches (20 pts) in team owned areas
- Connection of transmission and distribution power lines in shared areas (40 – 100 pts)
- Installation of transformers in any quadrant of field (40 or 60 pts)
- Autonomous delivery of spare tower insulator (200 pts)
- Multi-site autonomous delivery bonus (50 pts)
- Flexibility bonus – a power line segment, conduit trench filled, substation transformer, debris removed (100 pts)