

46th Annual National Collegiate Landscape Competition
March 16 - 19, 2022
North Carolina State University

ROBOTICS AND TECHNOLOGY IN LANDSCAPE DESIGN AND MAINTENANCE

Landscape maintenance is the art and vocation of keeping a landscape healthy, clean, safe and attractive. Very often maintenance is overlooked when the design for a given landscape is created. Landscapes that require more extensive maintenance routines result in higher labor and financial costs for property owners. In addition to these costs, the human and environmental impact of maintenance with traditional tools should also be considered.

Description: Students (maximum of two per school) will be required to answer a series of questions and/or problems related to sample residential and commercial projects. Some drawing and design calculations may also be required. Questions will be objective in nature.

1. Demonstrate understanding of robotic mower installation requirements in a residential setting by identifying the best possible solution for given properties. Sketch and identify all components necessary to complete installation. Plans should appropriately consider property size and installation criteria, passage dimensions, separate/disconnected maintenance areas, obstacles and other landscape design features.
2. Determine, from a given set of examples, what commercial properties would benefit most from the use of robotic mowers. Identify the potential benefits for each site.
3. Rank provided landscape designs from most to least suitable for autonomous lawn maintenance. Identify obstacles to installation and utilization. Provide suggestions on how each could be modified to increase coverage of robotic deployment, without significantly impacting the original design intent.
4. Identify sources, pollutants, impacts and effects of gas-powered maintenance equipment on people, communities and the environment. Calculate impact on environment for current and alternative landscape maintenance technologies.

Time: 1 hour and 50 minutes

Limits: The sponsor reserves the right to limit the number of individuals competing based on space constraints. Schools will be able to compete based on the date their registrations were received and paid. Registrations that are received late or have not been paid will be placed on a waiting list.

JUDGING CRITERIA

Points: 100 possible points for the individual score; individual scores are combined toward the team score for a total of 200 possible points.

Points will be assigned based on the following criteria:

Solutions will be scored against a pre-determined solution. Time will be used only as a tiebreaker.

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Students are required to bring the following materials to the event:

Calculator
Engineer and Architect scale
Pencils with erasers
Scratch paper

Sponsor is required to supply the following materials for the event:

Copies (appropriate number) of test materials (questions, explanations, etc.) and multiple choice answer sheets
Stopwatches
Sufficient number of judges and event monitors
Final solution ready for scoring the students solutions

Study Guides:

Husqvarna Operators Manual for 430XH and 450XH

https://www.husqvarna.com/ddocdownload/HUSO%2FHUSO2019_NAen%2FHUSO2019_NAen_1141532-95.pdf

Husqvarna Automower Installation Video

<https://www.husqvarna.com/us/lawn-and-garden/how-to-guides/automower-installation/>

Husqvarna Automower Answers

<https://www.husqvarna.com/us/products/robotic-lawn-mowers/>

Environmental Impact

<https://www.agza.net/problems-overview>

<https://ww2.arb.ca.gov/resources/fact-sheets/small-engines-california>

<https://ww2.arb.ca.gov/resources/documents/health-and-environmental-impacts-leaf-blowers>