

# The Race of Doom

DESIGN DOCUMENT

## Team #44

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# Executive Summary

## Development Standards & Practices Used

<a href="#">IEEE 829</a>	Software Test Documentation
<a href="#">IEEE 1028</a>	Standard for Software Reviews and Audits
<a href="#">IEEE 1074</a>	Software Development Life Cycle
<a href="#">IEEE 1547</a>	Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces
<a href="#">IEEE 2050</a>	RTOS for embedded systems standard
<a href="#">IEEE C37.2040</a>	Standard Cybersecurity Requirements for Substation Automation, Protection, and Control Systems
<a href="#">IEEE 260</a>	Standard Letter Symbols for Units of Measurement

## Summary of Requirements

- Design an autonomous vehicle capable of navigating a track while avoiding traps and competing with other vehicles.
- Ensure the vehicle can respond to remote control for speed adjustments.
- Implement onboard sensors for autonomous steering.
- Address potential hacking attempts on the control system that could lead to crashes.

## Applicable Courses from Iowa State University Curriculum

CprE 288

EE 230

EE 201

CprE 437x

CprE 185

CprE 186

CprE 381

## New Skills/Knowledge acquired that was not taught in courses

Professional Communication

Safety Training for Machine Shop

Woodworking

3D modeling

Money management

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# 1 Team

## 1.1 TEAM MEMBERS

1.1.1 Zechariah Mundy, Vincent Quattrone, Simon Aguilar, Taylor Moore, Chris Agyare, Jaxon Dennis

## 1.2 REQUIRED SKILL SETS FOR YOUR PROJECT

Professional Communication

Safety Training for Machine Shop

Woodworking

3D modeling

Money management

Wiring

Programing

## 1.3 SKILL SETS COVERED BY THE TEAM

Taylor – I have experience with power tools, woodworking, metalworking, and welding, in addition to experience in project management.

Chris - I have experience with understanding circuit components and when to use them. In addition, I have the knowledge of programming Audinos for any device we need.

Jaxon - I have experience with Arduinos, circuit design, CNC machining, programming: C, and soldering.

Vince – I have experience in wireless cybersecurity systems such as RF and Bluetooth. Experience in cryptography, and network intrusion. I also have experience in the following languages: C/Embedded C, Java, Python, and C++.

Zech – I have experience with the programming languages: Java, C, Python, and Assembly. My skills also include my experience with soldering, power tools and modeling software. I'm also familiar with wireless communication technologies including both Wi-Fi and Bluetooth

Simon – I bring my knowledge of programming acquired at DMACC and ISU languages: C, C++, Java, Laber, HTML, MySQL, Swift, Mango DB, and JavaScript. Also, my skills in woodworking, soldering, and wiring.

#### 1.4 PROJECT MANAGEMENT STYLE ADOPTED BY THE TEAM

Modified Agile

#### 1.5 INITIAL PROJECT MANAGEMENT ROLES

- a. Team organization: Taylor
- b. Team Representative/client interaction: Taylor
- c. Testing: Chris / Vince
- d. Component Design: Zech/Jaxon