

# Risk Assessment Safety Plan

## Project information:

Senior Design Project 303: F1/10<sup>th</sup> Autonomous Vehicle

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Team Member	Name of Project	Date of submission
	Phone Number	e-mail
Derek Swenson	941-993-8751	<a href="mailto:Das15j@my.fsu.edu">Das15j@my.fsu.edu</a>
Cody Vanderpool	513-319-9224	<a href="mailto:Clv15@my.fsu.edu">Clv15@my.fsu.edu</a>
Steven Roy	850-960-1861	<a href="mailto:Sbr15b@my.fsu.edu">Sbr15b@my.fsu.edu</a>
Nicholas Stiles	904-945-8149	<a href="mailto:Nhs15@my.fsu.edu">Nhs15@my.fsu.edu</a>
Michael Calisi	561-674-4867	<a href="mailto:Mjc15r@my.fsu.edu">Mjc15r@my.fsu.edu</a>
	Phone Number	e-mail
Faculty mentor		
Dr. Hooker	850-410-6463	<a href="mailto:hooker@eng.famu.fsu.edu">hooker@eng.famu.fsu.edu</a>
Dr. McConomy	850-410-6624	<a href="mailto:smcconomy@eng.famu.fsu.edu">smcconomy@eng.famu.fsu.edu</a>

## I. Project description:

Design and build an autonomous 1/10th scale race car.

## II. Describe the steps for your project:

Electronics assembly  
 Vehicle assembly  
 power distribution assembly  
 3-D Printing components  
 Programming of vehicle  
 Integration of all systems  
 Testing

## III. Given that many accidents result from an unexpected reaction or event, go back through the steps of the project and imagine what could go wrong to make what seems to be a safe and well-regulated process turn into one that could result in an accident. (See examples)

Electronics assembly – mild burns from soldering, minor shock from battery, small battery explosion, getting pricked by wires, and small circuit fires.  
 Vehicle assembly – minor cuts from metal, stabbed by screw, and possibly shrapnel  
 Power distribution assembly – minor shock from batter, exploding battery, burns from soldering iron, pricks from wires and small circuit fires.  
 3-D Printing Components – minor burns from the extruder  
 Programming of Vehicle – Carpal Tunnel Syndrome  
 Integration of all systems – minor cuts from metal  
 Testing – fingers could get caught in motors, small shocks from battery, small circuit fires, small battery explosions, ankles could get hit by runaway vehicle

## IV. Perform online research to identify any accidents that have occurred using your materials, equipment or process. State how you could avoid having this hazardous situation arise in your project.

Electronics assembly – never operate on live circuits, stay mindful of soldering iron, never over-charge batteries.  
 Vehicle assembly – be mindful of sharp edges on metal pieces, keep screws in containers, never over tighten screws.  
 3D Printing – Never touch the extruder during or shortly after use  
 Programming of vehicle – Take breaks during coding, operate at an ergonomic coding station  
 Integration of all systems – stay mindful of sharp objects

Testing – disconnect motor from battery before operation, never operate on live circuits, never overcharge batteries, be aware of vehicle locations at all times, implement a speed cap during testing, keep a safe distance from vehicle, where closed toe shoes.

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**V. For each identified hazard or “what if” situation noted above, describe one or more measures that will be taken to mitigate the hazard. (See examples of engineering controls, administrative controls, special work practices and PPE).**

Electronics assembly – keep fire extinguisher and first aid kit on hand

Vehicle assembly – keep first aid kit on hand

3D printing – keep first aid kit on hand

Programming vehicle – take breaks if wrists start to hurt.

Integration of all systems – keep first aid kit and fire extinguisher on hand

Testing – keep first aid kit and fire extinguisher on hand

**VI. Rewrite the project steps to include all safety measures taken for each step or combination of steps. Be specific (don’t just state “be careful”).**

During Assembly for any portion of project – keep workspace organized and be mindful of sharp edges. Always operate with another team member present and within close distance of fire extinguishers and first aid kits.

3D printing – never touch the extruder during operation and keep glass protector in place to avoid chance for injury.

Programming vehicle – during programming be sure to take routine breaks.

Testing – always test system while multiple team members are present and within reach of first aid kits and fire extinguishers.

**VII. Thinking about the accidents that have occurred or that you have identified as a risk, describe emergency response procedures to use.**

In case of small fire – use extinguisher to put out fire

In case of extreme fire – utilize fire evacuation routes and pull the fire alarm.

In case of minor cuts – treat with first aid kit

In case of major cuts – apply pressure and proceed immediately to hospital

In case of broken fingers – proceed to hospital

In case of battery explosion – disconnect system and treat burns (if any)

In case of burn – run under cool water and treat with first aid kit

**VIII. List emergency response contact information:**

- Call 911 for injuries, fires or other emergency situations
- Call your department representative to report a facility concern

Name	Phone Number	Faculty or other COE emergency contact	Phone Number
		Dr. Hooker	850-410-6463
		Dr. McConomy	850-410-6624

**IX. Safety review signatures**

- Faculty Review update (required for project changes and as specified by faculty mentor)
- Updated safety reviews should occur for the following reasons:
  1. Faculty requires second review by this date:
  2. Faculty requires discussion and possibly a new safety review BEFORE proceeding with step(s)
  3. An accident or unexpected event has occurred (these must be reported to the faculty, who will decide if a new safety review should be performed.
  4. Changes have been made to the project.

Team Member	Date	Faculty mentor	Date

**Report all accidents and near misses to faculty mentor.**