GONZAGA UNIVERSITY | School of Engineering & Applied Science

SEAS STUDENT PROJECTS SAFETY ASSESSMENT AND RISK MANAGEMENT FORM

Welcome to the Project Safety Assessment and Risk Management Form!

This form helps your project run safely and meets safety standards. Whether you're working in a lab, workshop, or off-site, this guide will help you complete the form quickly and effectively.

Why This Form is Important

- **Identify Risks:** Spot hazards before they cause problems.
- **Stay Compliant:** Meet university and legal safety requirements.
- **Prepare for Emergencies:** Know what to do when things go wrong.

Quick Tips for Success

1. **Be Brief:** Use bullet points for clear and concise answers.
2. **Team Effort:** Work with your team to brainstorm hazards and solutions.
3. **Follow Examples:** Look for examples provided to guide your responses.
4. **Pay Attention to Highlights:** Highlighted sections mark critical actions and areas needing attention.
5. **Seek Guidance:** Ask your advisor, EH&S manager, SEAS technical support or lab manager if you're unsure about any section.
6. **Training:** Request faculty provide lab-specific training on safety and equipment use.

Key Sections to Focus On

- **Project Summary:** Outline your project's goal and importance.
- **Identified Hazards:** Brainstorm with your team to list risks.
- **Safety Matrix:** Plot hazards to prioritize which need action.
- **Emergency Procedures:** See to it your team knows the steps during emergencies.

Step-by-Step Completion

1. **Time Required:** Set aside 30-45 minutes to complete the form with your team.
2. **Follow the Order:** Start with the project overview and move sequentially; this helps connect all safety aspects.
3. **Review Together:** Go over the form as a group to see to it that all details are correct.

Final Thoughts

Filling out this form isn't just about compliance—it's about practicing real-world safety skills that are essential in engineering. Your effort here ensures a safer project and builds habits that will benefit your future career.

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Project Overview

☐ Project Summary and Objectives:

Summary: We are developing a smart watering system that combines IoT sensors and MathWorks tooling to enable real-time data monitoring and analysis of indoor gardening. The IoT devices will capture key environmental conditions such as soil moisture, while ThingSpeak and MATLAB process this data. A state machine will then determine if the plants require watering. If they do, the system will send a notification, allowing the user to react by starting the watering strategy or aborting.

Objectives: Of the desired outcomes, this project's primary business objective is to show the utility of MathWorks' tools in developing an IoT-enabled smart watering system. In application, this will be done using MathWorks' ThingSpeak plugin to facilitate communication between IoT devices and MATLAB to process the produced data. Conclusions will then be drawn from this data using a state machine.

☐ Duration: August 2024 - May 2025

Team Members

☐ Names, Roles & Contact Information:

Name	Role	Email	Phone number
Caleb Lefcort		clefcort@zagmail.gonzaga.edu	(509)710-3129
Matt Nguyen		mnguyen4@zagmail.gonzaga.edu	(503)473-7870
Madison Spink		mspink2@zagmail.gonzaga.edu	(509)828-7343
Arvand Marandi		amarandi@zagmail.gonzaga.edu	(425)903-6784

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Project Environment and Location:

☐ Gonzaga univeristy Hughes 216

Equipment and Materials

☐ List of Equipment and Materials:

Arduino Uno Rev3 Microcontroller, Moisture Sensor,Temperature/Humidity Sensor, Arduino Relay (2), Breadboard + Jumper Wires, Grow light, Water Pump, Grow tent, Fan.

☐ Safe Use Instructions:

Arduino Uno Rev3 - Use correct voltage (7-12V DC). Avoid touching powered components. Disconnect power when rewiring.
Sensors - Keep electronics dry and probes clean to prevent short circuits and corrosion.
Arduino Relay - Ensure proper insulation and don't exceed load limits (10A at 250VAC). Isolate high-voltage wiring.
Grow Light- Ensure proper insulation, secure mounting, and ventilation. Handle high voltage with care.
Water Pump - Avoid exposing electrical parts to water. Don't run the pump dry. Use waterproof connectors.
Grow Tent - Prevent electrical overloads and ensure ventilation. Keep electrical equipment dry.

Activities and Procedures

☐ Description of Activities:

This project is a smart indoor irrigation system that will run in Hughes 216 after the state machine is verified running.

☐ Step-by-Step Procedures:

None as yet.

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Potential Hazards and Risks (SEE SAFETY MATRIX)

☐ Identified Hazards:

Mild electrical shock
Overheated Grow light in tent
Overheated vent fan

☐ Risk Assessment:

Mild electrical shock -- 4X1=1
Overheated grow light in the tent -- 2X2=4
Overheated Vent fan -- 3X2 = 6
Overheated Water Pump -- 3X2 = 6
Unauthorized Physical access to grow area. -- 2X1 = 2

Safety Measures and Controls

☐ PPE Required:

N/A

☐ Safety Protocols:

Team follows safety protocols as defined by the Biology department required for use of the room.

☐ Incident reporting: www. Accident Injury & Occupational Illness Report Form

In the event of an incident, reports will be made to Biology department and SEAS and others as required by Gonzaga policy.

☐ Emergency Procedures:

Team follows emergency procedures as required by Biology department in the event of an emergency as required for use of the room.

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Training and Competence

☐ Required Training: www. Get Started in the MTC

☑ N/A -- The project does not require the resources of the MTC

☐ Training Records:

☑ N/A

Supervision and Support

☑ Project Advisors name: Rafael Pozos

☑ Email address: pozos-brewer@gonzaga.edu Phone #: 5102829794

Hazardous Materials and Waste Management Disposal

☐ Disposal Procedures: www. Hazardous Waste Pickup Request Incident

N/A -- we do not anticipate needing to dispose of any hazardous materials.

☐ Recycling and Waste Minimization Strategies: www. Trash, Recycle or Compost:

All trash and recycling will be handled in accordance with GU's recycling and waste minimization strategies.

Regulatory Compliance

Identify Relevant Regulations

www. Environmental Health and Safety

☐ List applicable laws, regulations, and university policies:

N/A

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Compliance Measures

Document actions taken to comply with each regulation:

N/A

Permits and Approvals: www. Risk Management

N/A

Off-site Projects Safety Considerations

N/A -- This project has no off site safety considerations

Emergency Preparedness

Emergency Contacts: www. ZagAlert

All on campus will opt in to the ZagAlert system

Evacuation Routes: www. Gonzaga University Emergency Evacuation Maps

If issue occurs in Huges 216, team will follow Biology department evacuation protocols.

Contingency Plans:

No phyisical contingency plan is required for this due to it being low risk and other physical safety protocols in effect from the Biology department.

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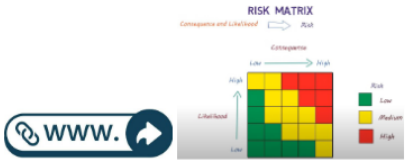
Safety Matrix

- Plot each identified hazard in the matrix according to its likelihood and potential impact.
- Example: If using a power drill has "Possible" likelihood and "Major" impact, mark it in the corresponding box.
- This helps prioritize which risks require immediate attention and mitigation measures.

Safety Matrix Example

Likelihood / Impact	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain					
Likely					
Possible				Power Drill Risk	
Unlikely					
Rare					

Video examples: click on images below.



Additional Instructions:

- Identify and list each potential hazard.
- Fill out the safety matrix for each identified hazard.
- Establish that each hazard is assessed for its likelihood and impact.

Signature(s)

Advisor review and approval

_____ Date_____

Team members

_____ Date _____

_____ Date _____

_____ Date_____

_____ _____ Date_____

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Appendix:

N/A

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Notes:

This is a relatively low safety concern project primarily based on software with some low voltage control hardware running. We belive this to be low risk.