Student Project Hazard Assessment

A Hazard Assessment is designed to help students and project advisors recognize hazards associated with student projects at the early planning stages to find ways to minimize the chance of injury, loss, or harm while you are working on the project. This form is intended to be used for projects where the primary hazards are associated with engineering work (physical, mechanical, electrical, etc.). Chemical and biological focused projects require a separate project assessment form.

Each student project must complete a Hazard Assessment form, even if the project is not expected to have any hazards. All required approvals must be obtained before proceeding with the project. It is important that all team members participate in the process, with close supervision of your advisor. To help ensure that hazards and risks associated with your project are not overlooked or underestimated, you are encouraged to contact any university staff (Lab Directors/Managers, EHS, etc.) with relevant knowledge or experience for guidance.

The Hazard Assessment process usually involves these five steps below, with an example:

Step:	Example:
1. Identify the specific tasks that must be completed to reach your project goals	One of your project tasks involves testing a live electrical circuit
2. Determine if there are hazards associated with completing the tasks	On the form, you select the "Electrical parts and assemblies > 50V or high current", under the Hazardous Conditions/Processes/Activities, Electrical Hazard section
3. If hazards exist, **identify the risks** connected with the hazards of each task. Ask yourself, what could go wrong? If you are not already familiar with the risks, do a quick internet search	After some research, you learn that there is potential of electrical shock from accidental contact with exposed live components
4. Develop a list of controls (things you can do) to eliminate the hazard or reduce the risks. Refer to *Hierarchy of Controls* on the next page	To minimize the risk identified above, you could: o De-energize and isolate the system or o Guard live components to prevent accidental contact
5. Create a safe working procedure. Describe how you will safely complete each task	You write a detailed procedure for testing a live electrical wire, that includes all the information from your hazard/ risk assessment and which controls you will use to reduce the risks
6. Submit your hazard assessment form for approval (see section below for details)	

Definitions:

A **Hazard** is something that has the potential to cause harm (injuries, accidents, or other undesirable effects). Hazards can be eliminated but not reduced. A hazard can be in the form of an Agent, Condition, Process or Activity.

Risk is the likelihood (probability) of a hazard causing harm to people, property or the environment. Risks associated with a hazard can be reduced. Put another way, *Risk = Hazard x Exposure*

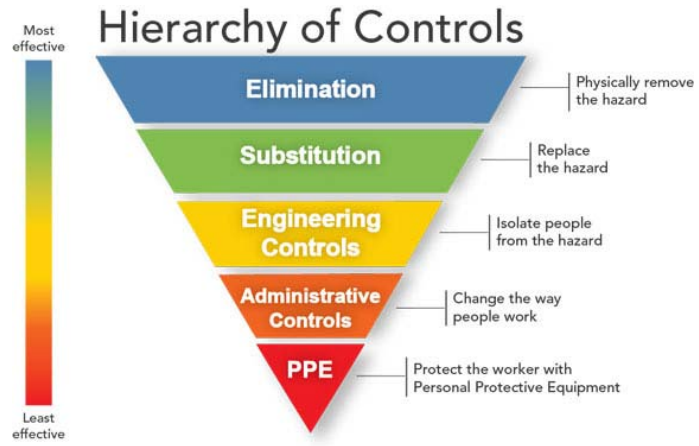
A **Hazard Assessment** is the process of identifying anything that can cause harm (hazardous agents, conditions, processes or activities).

A **Risk Assessment** is the process of determining how great the chance is of harm occurring from a given hazard.

Hierarchy of Controls

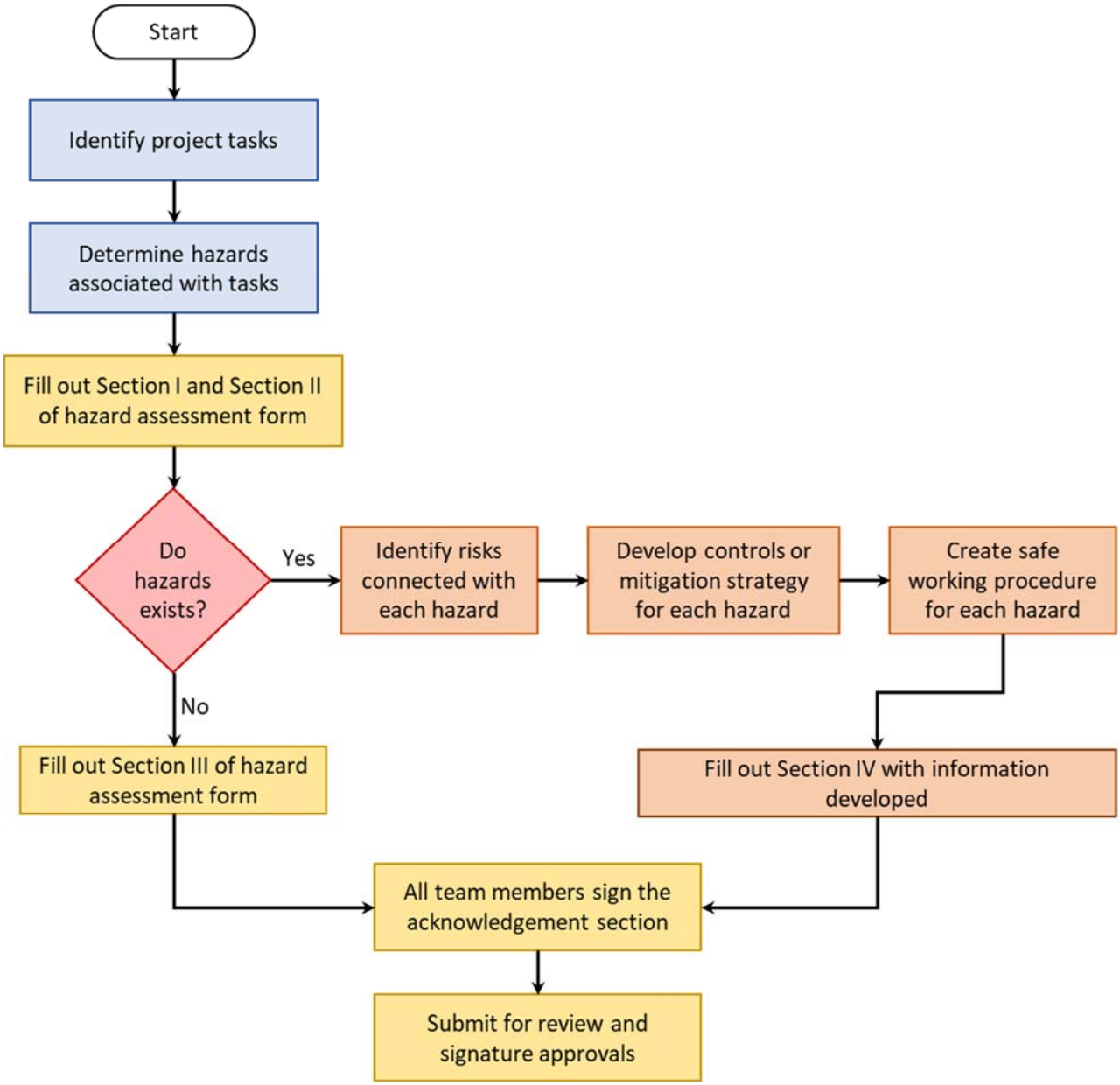
Unless the hazardous agent, condition, or activity is removed, hazards cannot be eliminated. However, risks from the hazard can be minimized by employing the proper control measures and safe work practices that will have been identified from completing a hazard assessment.

Some controls are more effective than others at eliminating hazards or reducing risk. Use the hierarchy of controls chart below to evaluate the controls measures you plan to use. Priority should be given to the most effective controls at the top of the hierarchy (elimination and substitution) and moving down, rather than start with the easiest one. While personal protective equipment (PPE) should always be used, it should be considered the last line of defense from potential hazards.



Hierarchy of Controls		Description and Examples
Most Effective	Eliminate the Hazard	Use alternative work procedures
	Substitution	Use less hazardous material or process
	Engineering Controls	Isolate people from hazard using ventilation, barriers, lock-out, safer equipment and tools, etc.
	Administrative Controls	Change the way people work: rules, warning signs, training, alarms, safe working procedures, etc.
Least Effective	Personal Protective Equipment (PPE)	Appropriate clothing and footwear, safety glasses/goggles, lab coat, welding mask, face shield, ear plugs, etc. Best if used in combination with engineering controls

Hazard Assessment Form Process:



1. After completing the form, all team members must sign the acknowledgement section.
2. Your advisor and the department chair must approve this form prior to obtaining *formal* approvals from other university staff.
3. If your project involves the use of lab or shop space or equipment, the form must be routed to the appropriate lab/shop manager(s) for review and approval.
4. Your faculty advisor or department chair will make the determination whether EHS approval is additionally required.
5. Depending on the scope of your project, the faculty advisor, department chair, lab/shop manager(s), *or* EHS may request further approval from other relevant faculty, staff, or department.

Student Project Hazard Assessment Form

This form is to be used for student projects where the primary hazards are associated with engineering work (physical, mechanical, electrical, etc.). Chemical and biological focused projects require a separate form.

Complete this form and obtain all the required approvals (Faculty Advisor, Department Chair, Laboratory Manager, EHS, etc.) before proceeding with the project. Please refer to the hazard assessment guide for assistance in filling this form.

SECTION I: Project Description

Project Title:			
Project Team Members:			
Project Faculty Advisor Name:	Department:	Phone:	Email:
Proposed Project Location(s) (Department, building, room#):			
Anticipated Dates of Project Duration:			
Summary of Project Objectives:			

SECTION II: Hazard Checklist

Identify all the tasks that must be completed for your project. Carefully evaluate each task to determine if there are any associated hazards. After identifying the hazards of your project, you will be asked to assess the risk connected to each hazard and to identify control measures that will either eliminate the hazard or reduce the risk to an acceptable level. Safe work procedures for each step involving a known hazard will need to be developed.

HAZARDOUS CONDITIONS/PROCESSES/ACTIVITIES		
Electrical Hazards	**Mechanical Hazards**	**Physical Hazards**
☐Electrical parts and assemblies > 50V or high current ☐Batteries ☐Control Panels	☐Power tools and equipment ☐ Machine guarding/power transmission – gears, rotors, wheels, shafts, belt/chain drives, rotating parts, pinch points ☐Robotics ☐Sharp Objects ☐ Stored Energy (springs, gravity, pneumatic, hydraulic, pressure)	☐ Extreme temps (high temp fluids: water > 160 °F, steam, hot surfaces > 140 °F, cryogenic fluids ☐ Material handling of heavy objects ☐ Elevated heights (scaffolding, ladders, roofs, lifts, etc.) ☐ Overhead falling objects (cranes, hoists, drones, projectiles, etc.) ☐ Confined Spaces ☐Airborne Dusts ☐Bonding / Grounding ☐Electrostatic Discharge
Reaction Hazards	**Hazardous Processes**	**Other Hazards**
☐Explosive ☐Exothermic, with potential for fire, excessive heat, or runaway reaction ☐Endothermic, with potential for freezing solvents decreased solubility or heterogeneous mixtures ☐Gases produced ☐Hazardous reaction intermediates/products ☐Hazardous side reactions	☐Generation of air contaminants (gases, aerosols, or particulates) ☐Heating chemicals ☐Large mass or volume ☐Pressure > Atmospheric ☐Pressure < Atmospheric ☐Scale-up of reaction ☐Metal fabrication (soldering, welding, cutting, drilling, etc.) ☐Construction/Assembly, etc.	☐Noise > 80 dBA ☐Vehicle traffic ☐Hazardous waste generation ☐Other (list):
☐ **Check here if project will not involve any hazardous conditions, processes, or activities**		

Hazard Checklist (continued)

HAZARDOUS AGENTS			
Physical Hazards of Chemicals	**Health Hazards of Chemicals**	**Non-Ionizing Radiation**	**Biohazards**
☐Compressed Gases ☐Cryogens ☐Explosives ☐Flammables ☐Oxidizers ☐Peroxides or Peroxides Formers ☐Pyrophorics ☐Water Reactives	☐Acute Toxicity ☐Carcinogens ☐Nanomaterials ☐Reproductive Toxins ☐Respiratory or Skin Sensitization ☐Simple Asphyxiant ☐Skin Corrosion/ Irritation ☐Hazards Not Otherwise Classified	☐Lasers ☐Magnetic Fields (e.g. NMR) ☐RF/Microwaves ☐UV Lamps	☐BSL-2 Biological Agents ☐rDNA ☐Human Cells, Blood, BBP ☐Animal Work ☐Other (List):
☐ **Check here if project will not involve any hazardous agents**			

SECTION III: Projects with No Hazards

IF your project meets all these conditions:

- ☐ No hazardous condition processes, or activities
- ☐ No hazardous agents
- ☐ Will not use any laboratory or shop space

You can stop at this section. Acknowledge below and obtain the approvals from 1) Faculty Advisor, and 2) Department Chair.

If your project involves hazardous processes, activities, conditions or agents are, please continue to SECTION IV to complete the rest of the form.

ACKNOWLEDGEMENT (for projects with no hazards)

By signing, I verify that the project will not involve any hazards listed in Section II

Name of Project Team Member	Signature	Date

APPROVALS (for projects with no hazards)

This document must be reviewed and approved by the people below before any project work can begin. A copy of the approved document must be kept where the work is being conducted

Faculty Advisor (required)

Name:

Department:	Signature	Date

Department Chair (required)

Name	Signature	Date

SECTION IV: Hazard Assessment and Control

Description of Potential Hazards

Provide a summary of the procedure and describe the risks associated with each hazard that you have identified above or on the previous page. Use one box below per hazard. You may add supplemental pages if needed. Define the hazard control measures that will be employed to minimize the risks based on the hierarchy of controls (elimination, substitution, engineering controls, administrative controls, PPE), and then describe specific control measures you will use (e.g. work on system de-energized, receive hazard specific training, shield hot surfaces, guard pinch points, relieve stored energy, wear protective equipment, use less hazardous chemical, etc.). Refer to "Hierarchy of Controls" in the instructions sheet for more information to decide which hazard controls measures are most appropriate.

Hazardous Activity, Process, Condition, or Agent (identified from previous page):
Summary of Procedure or Tasks:
Describe Hazards (why is the procedure hazardous or what can go wrong – what is the risk):
Hazard Control Measures (what you will do to eliminate the hazard or minimize risks):

Hazardous Activity, Process, Condition, or Agent (identified from previous page):
Summary of Procedure or Tasks:
Describe Hazards (why is the procedure hazardous or what can go wrong – what is the risk):
Hazard Control Measures (what you will do to eliminate the hazard or minimize risks):

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Summary of Procedure or Tasks:
Describe Hazards (why is the procedure hazardous or what can go wrong – what is the risk):
Hazard Control Measures (what you will do to eliminate the hazard or minimize risks):

Hazardous Activity, Process, Condition, or Agent (identified from previous page):
Summary of Procedure or Tasks:
Describe Hazards (why is the procedure hazardous or what can go wrong – what is the risk):
Hazard Control Measures (what you will do to eliminate the hazard or minimize risks):

Hazardous Activity, Process, Condition, or Agent (identified from previous page):
Summary of Procedure or Tasks:
Describe Hazards (why is the procedure hazardous or what can go wrong – what is the risk):
Hazard Control Measures (what you will do to eliminate the hazard or minimize risks):

SAFETY EQUIPMENT and PPE

Select the appropriate PPE and safety supplies you will need for the project (Check all that apply)

☐ Appropriate street clothing (long pants, closed-toed shoes)

☐ Gloves; indicate type: _____

☐ Safety glasses/ goggles

☐ Face shield and goggles

☐ Lab coat

☐ Hearing protection

☐ Fire extinguisher

☐ Eyewash/safety shower

☐ Spill kit

☐ Other (list):

TRAINING REQUIREMENTS

Identify the appropriate training (check all that apply)

☐ Biology & Bioengineering Lab Safety Camino Course – contact Lab Manager or EHS to enroll

☐ Chemistry & Biochemistry Lab Safety Camino Course – contact Lab Manager or EHS to enroll

☐ Electrical Safety for Engineering Camino Course – contact EHS to enroll

☐ LiPo Battery Safety Training – contact MAKER Lab to enroll

☐ Review of SDS for chemicals involved in project – access SDS library at: chimeracloud.org/sds/

☐ Laboratory Specific Training – contact Lab or Shop Manager/Director

☐ Project Specific Training – contact Faculty Advisor

☐ Other (describe below):

EMERGENCY PROCEDURES

Life-threatening emergencies (fire, explosion, hazardous material spill/release, hazardous gas leak, etc.)

1. Call **SCU Campus Safety: 408-554-4444** or **911**
2. Alert people in the vicinity and if necessary, activate the local alarm systems
3. Evacuate to your emergency assembly point (EAP). Fill in your EAP here: _____
4. Remain nearby to advise emergency responders

For medical emergencies:

1. Stay with the individual if it is safe to do so. Do not move the individual unless absolutely necessary
2. Call SCU Campus Safety or 911
3. Administer first aid if you are trained to do so

If person received an electrical shock:

1. Do not touch the person
2. Shut off power and/or rescue the person with non-conductive object IF it is safe to approach
3. Call SCU Campus Safety or 911
4. Administer CPR or AED if trained to do so

If person exposed to hazardous materials:

1. Flush contamination from eyes/skin using the nearest emergency eyewash/shower for a least 15 minutes. Remove any contaminated clothing
2. Call SCU Campus Safety or 911

For building maintenance emergencies (e.g. power outages, plumbing leaks): call Facilities at 408-554-4742

REPORT all injuries and incidents (including near misses) to faculty advisor and EHS

Project work outside of SCU campus

Generally, all project work must be performed at SCU campus. However, there may be few cases where work cannot be completed on campus (e.g. competition venue outside of SCU, no appropriate campus location to field-test). These exceptions must be described in the hazard assessment section above. Specific location(s) and their scope of work must have approval from the faculty advisor. Additional approvals may be required.

Check the appropriate project location scope:

☉ All project work will be performed on SCU campus

○ All project work cannot be completed on SCU campus. Provide more details below:

List offsite location(s) and provide description:

Describe supervision arrangements and specific emergency procedures for each offsite location:

ACKNOWLEDGEMENT

By signing, I verify that:

1) I am aware of the hazards and risks of all the tasks associated with the project
2) I have received, or will receive all the necessary safety training and/or have read the safety manual and safety data sheets (SDSs) relevant to the project before performing any hazardous tasks
3) I will follow all required safety precautions while working on this project, including but not limited to use of engineering controls, following safe work practices, and wearing appropriate personal protective equipment, as well as all emergency procedures

Name of Project Team Member	Signature	Date

APPROVALS

This document must be reviewed and approved, in the order listed below, before any project work can begin. A copy of the approved document must be kept where the work is being conducted

1. Faculty Advisor (required)

Name:		
Department:	Signature	Date

2. Department Chair (required)

Name	Signature	Date

3. Laboratory Director/Manager
(required if project involves use of lab or shop space)

Name	Signature	Date

4. EHS
(required as determined by faculty advisor, department chair, or lab director/manager)

Name	Signature	Date

5. Other
(if requested by faculty advisor, department chair, lab director/manager, or EHS)

Name	Signature	Date