

PROJECT SAFETY PLAN

All projects conducted in the School of Electrical and Electronic Engineering are required to put in place a Project Safety Plan (or PSP). This involves identifying the hazards which may be present and stating what control measures will be put in place to control the risk associated with the hazard. This form is typical of that used in other third-level institutions. The following sets out the steps to be taken by the supervisor and the student to ensure the correct completion of the Project Safety Plan.

1. There should be a separate Project Safety Plan for each student.
2. The supervisor should arrange to meet with the student as early as possible to review the Project Safety Plan and to complete the Project Safety Plan form. The supervisor should explain any hazards that might arise during the duration of the project and ensure that the student understands the nature of the hazard and the control measure to be employed.
3. ALL SECTIONS should be completed. If a hazard is not applicable, please record it as N/A.
4. The supervisor and student must jointly sign the completed Project Safety Plan form (under the current Covid-19 measures electronic signatures are acceptable).
5. The signed form (with a copy of the project proposal) must be submitted to the SEEE Administration Office at seee.admin@tudublin.ie. Both the supervisor and the student should retain a copy.
6. The SEEE Health & Safety Advisory Committee will review the submitted Project Safety Plan and where deemed necessary the form may be returned for further clarification or the inclusion of additional control measures.
7. The Project Safety plan should be reviewed with the student regularly over the project period at project meetings. In particular if throughout the project work plan or focus changes, the Project Safety Plan should be reviewed and a revised Project Safety Plan should be submitted.

Project Safety Plan

Student Name	Talha Tallat	
Student Number	D18124645	
Programme Code and Year	TU821 (DT021A) & Year 4	
Start Date of Project	24/01/2022	
Estimated Finish Date of Project	27/05/2022	
Location(s) of Project (i.e. building and room number). If the project is to be carried out at home, please state HOME.	Lower ground of TU Dublin Grangegorman Lower, Dublin 7, D07 H6K8CQ, Room LG02 Machines Lab	
Supervisor Name	Mr Colm Murry	
Title of Project	To investigate the use of Si Carbide MOSFETs in an H-bridge	
Is the Project Shared (Yes/No)?	No	
Does the Project Involve working with mains electricity other than the power supply to a PC or laptop (Yes/No)?	Yes	
Description of Project		
<p><i>Give a brief description of the project, location, machinery, equipment necessary, high voltages, mains voltages, chemicals needed, lone working required, fieldwork etc.</i></p> <p><i>The project is an investigation to observe the behaviour of Silicon Carbide MOSFET in H-bridge. The SiC MOSFET gate driver is used to control SiC MOSFET power switching at various higher switching frequencies. The controller and gate drive system will also be built and tested, where the microcontroller supplies Pulse with modulation (PWM) varying from 0 to 5v into the gate of the drivers. The project will take place on the lower ground in machine lab room CQ-LG02 of the Grangegorman central quad campus building. Lone working will not be required. The required equipment will include high instantaneous voltages and current supply, function generator, oscilloscope, multimeter, Arduino, SiC MOSFET module driver, MOSFETS, Heatsink, flying back diode, wire strippers and soldering kit.</i></p>		
Hazard Identification		

Before starting, the Project Supervisor and Student must identify potential hazards and state what control measures they will employ to control the Risk. Below is a non-exhaustive list of the potential hazards that may be present, these can be used as a starting point. Ensure you identify the controls needed. These can include using a less dangerous chemical, training on the use of equipment, good lab or workshops practices, reporting defects, first aider present, following the out of hours access and off-campus activities procedures and other procedures, use of PPE, reference to existing safety documentation such as lab risk assessments, SOPs, safety data sheets, manufacturer's manuals etc.

Potential Hazards	Present (Yes/No)	Details (if potential hazard identified, please provide details)	Controls Required (please refer to available TU Dublin documentation. Additional controls may be required)
Work Equipment	Yes	Electric shocks due to the High voltage Power supplies (Up to 200V and 100A) coming in contact.	The project will be supervised under Lab technician while experimenting in the machine lab
Work Environment	Yes	Poorly maintained work environment workspace can result in accidents and injury	Keeping the workspace clean and tidy to avoid clutter, that may cause accidents. Ensuring that the floor of a workplace is clean to avoid tripping and carrying tools securely and safely. Storing equipment's properly when not in use.
Electrical Shock Hazard	Yes	Physical contact with Heat sink connected to the drain of the MOSFET and High-power supplies	A plastic cover will be used over the Heat sink as a safety feature to prevent electric shocks while experimenting. Plastic wire coatings and joints are sealed to prevent shocks and disconnect mains when handling electronic components.
Hand tools	Yes	Contact with hot soldering Iron and wire stripping tools can result in cuts and burns	Correct PPE standard is used to prevent any heat burns. Suitable coverings are used for sharp cutting tools to protect the tool and to prevent injuries. Cutting in a direction away from a body.
Power Tools	No		
Slips, trips, and falls	Yes	Wet or oily surfaces, occasional spills, weather hazards, unanchored rugs or mats can create serious hazards that can put workers at risk of sprains, strains, bruises, concussions, and fractures.	keeping walking areas clear from clutter or obstructions and maintaining the floor in good condition and using sufficient light for the tasks to reduce the risk of tripping. Paying attention to where going and adjusting stride to a pace that is suitable for the walking surface and walking with the feet pointed slightly outward and making wide turns at corners to avoid falling in the lab.
Manual Handling	No		
Soldering	Yes	There is a risk of electrocution if the tip makes contact with live wires and Thermal burns to the skin, inhalation of toxic fumes from solder and flux, absorption of lead residue on the hands. Soldering equipment operates at a high temperature (300-350 °C), and burns may	Keep all electric cables away from hot soldering iron tips and make sure the soldering iron is secure in stand and all mains cables are out of reach of soldering tips before switching on equipment. Ensuring soldering iron has cooled before storage. Hands must be washed after contact with solder. Wear suitable PPE while soldering, safety glasses with side protection and avoid leaving hot soldering irons unattended,

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		result from contact with the skin.	switch off or unplug when not in use. Use lead-free, rosin-free solder when soldering, as this poses the least long-term health risk.
Compressed Air/Pneumatic Equipment	No		
Rotating Machinery	No		
Noise	No		
Computer Usage	Yes	Consumption of food is in laboratories and workshops may damage the equipment.	Regular rest breaks are recommended. Avoid eating & drinking while present in the lab.
Lone Working	No		
Sudden Illness and/or Medical Emergencies	Yes	The risk of Coronavirus transmission is due to the number of people in close proximity. Risk of fatal injuries.	Wear face coverings and practice good hygiene etiquette at all times and maintain socially distance to avoid the risk of Coronavirus. Inform relevant staff during the medical emergency or Dial 112 or 999 when in danger or request for a medical emergency.
Fire/Emergency Evacuation	Yes	The risk of burning threatens the safety of persons, cause damage to property or equipment or disrupt campus operations.	Ensuring all work equipment protects against catching fire or overheating and ensuring electrical cords are in good condition to prevent fire. In case of fire, activate the nearest fire alarm call point and do not use the lift and leave the building using the nearest emergency exit. Inform relevant staff during the emergency and evacuate the building and go to designated areas of safety where people assemble following an evacuation. Dial 112 or 999 in an emergency to request for firefighters.
Biological Agents	No		
Chemical	No		
Gases	No		
Heat Sources/High Temperatures/Hot Surfaces	Yes	Soldering equipment operates at a high temperature (300-350 °C), and burns may result from contact with the skin. Overheating due to the high power	Wear suitable PPE while soldering, safety glasses with side protection and use forms of PPE that prevent molten solder from coming in contact with the skin.

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		exceeding rated voltage & current can damage the components and can go on fire.	
Lasers	No		
Vibrations	No		
Working off Campus / Field Work	No		
Working at Height (incl. use of ladders)	No		
What other Hazards could be present and what effect will they have on the student, fellow students or employees? Use a separate sheet if required.			

This project plan has been completed to the best of my abilities based on the information available to me, my understanding of the task at hand and the expected workplace conditions. The student should note that additional care is required for projects conducted remotely (i.e. at HOME) and should consult with their supervisor before undertaking any new tasks not previously discussed.

Student Signature and Date	Talha Tallat 02/02/2022	Supervisor Signature and Date	
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Category	Please indicate the category of supervision required (in order to process the form)	Tick one
Category A	The risks associated with the work and/or the inexperience of the student are such that the work must be supervised directly by a competent person (the supervisor or his/her authorized nominee), at least until the supervisor is satisfied that the student can follow correctly the appropriate scheme of work. Note: this might apply only to a small section of the whole project. This category is NOT permitted for projects conducted remotely (i.e. HOME projects).	<input checked="" type="checkbox"/>
Category B	The risks associated with the work and/or the inexperience of the student is such that the work may not be started without the supervisor's or his/her authorized nominee's advice and approval.	<input type="checkbox"/>
Category C	The Risks are such that the work requires considerable care but it is considered that the student is adequately trained and competent in the procedures involved.	<input type="checkbox"/>
Category D	The risks are low and carry no special supervision requirements.	<input type="checkbox"/>

THE SIGNED FORM SHOULD BE SUBMITTED TO THE SEEE ADMINISTRATION OFFICE AT SEEE.ADMIN@TUDUBLIN.IE (THE PROJECT SUPERVISOR AND THE STUDENT SHOULD RETAIN A COPY). PLEASE INCLUDE “PSP FORM [PROGRAMME CODE]” IN THE SUBJECT LINE OF THE EMAIL.