**Project / Ref. No.:**_____

# Health and Safety Risk Assessment for Experiment, Project and Off-Campus Activities

The objective of risk assessment is to perform a careful examination of what could cause harm to people (hazards / risks). When properly performed, it helps ascertain whether the effectiveness and adequacy of the precautions already in place, or whether more has to be done. Staff and students should assess their new experiments, projects and off-campus activities critically and fill in the form completely.

Risk assessment should also be performed:

- for those existing experiments, projects and off-campus activities which have not been assessed before;
- as soon as change occurs;
- after an incident/accident; and
- regularly for not less than once in a year.

- Please submit the completed form to Principal Investigator, Head of department ~~or Dean of School/ College~~ for his / her review, approval, recordkeeping and monitoring.
- The approved form should be copied to the student / staff involved for them to observe the control measures and put them in place.

**Please save the document and submit it via the online submission system (Click me)**

** Please expand boxes and add lines as required.*

## Part I - Particulars

| | |
|---|---|
| College/School: College of Engineering (CENG) | Department: MSE |
| **1. Person(s) Responsible for This Work (Principal Investigator):** (i.e. Your supervisor/Course leader) | |
| Name: | Position: MSE Faculty |
| **2. Person Carrying Out The Risk Assessment:** | |
| Name: | Position: Teaching assistant |
| Proposed start date of this work: | |
| Date risk assessment undertaken: | |

**3. Other Student/Staff Involved:** (e.g. Your Tutors/senior staffs/students under the same project)

| Name | Position | College/School | Department |
|---|---|---|---|
| | | | |
| | | | |

**4. Location of Activities:** (Please refer to "CAUTION" posted on the lab door)

| Location | Activities | Location-In-charge (Contact Number) |
|---|---|---|
| | | |
| | | |

| **5. Off-Campus Activities:** Usually not applicable for FYP students | |
|---|---|
| Verified with Finance Office (FO) and/or the insurance broker about the insurance coverage for the activity? | NO |

| **6. Animal involved:** Usually not applicable for FYP students | |
|---|---|
| NO *(If Yes, please provide relevant documents in (a) and (b))* | |
| a. Obtained animal research ethics approval | NO |
| b. Obtained animal research licence | NO |

**7. Experiment/ Project/ Off-Campus Activities Title:** (i.e. your FYP project/research project)

**8. Summary / Abstract of experiment, project or off-campus activities:**
*(Please provide a simple description of the work)* (i.e. your FYP project/research project)

**8.1 Overview of the work**

**8.2 Procedure of the work**

**9. Legal Requirement:**

**9.1 Specify and Legal Requirements/ Code of Practice from the Government (if any):**

## Part II (Risk Assessment)

Please break down the Experiment / Project / Off-Campus Activity into steps at the table below. Then by referring to **Appendix 1: Risk Assessment Guidance Notes**, identify as many as possible the potential hazards that could be created for each of the steps and write down the corresponding hazard code for each step. If there is more than one hazard, please create a new entry.

| Hazard Code@ | Operation/Process Involved | Existing Risk Rating | | | Control Measures+ | Residual Risk Rating | | |
|---|---|---|---|---|---|---|---|---|
| | | H# | L* | R^ = H x L | | H# | L* | R^ = H x L |
| | | NA | NA | NA | | NA | NA | NA |
| | | NA | NA | NA | | NA | NA | NA |
| | | NA | NA | NA | | NA | NA | NA |
| | | NA | NA | NA | | NA | NA | NA |
| | | NA | NA | NA | | NA | NA | NA |
| | | NA | NA | NA | | NA | NA | NA |
| | | NA | NA | NA | | NA | NA | NA |

*Remark:*
*@ Refer to Appendix 1, Section 1* Checklist of Potential Hazards and Corresponding Hazard Code
*# Refer to Appendix 1, Section 2 Risk Rating – Table 2: Description of Hazard Severity*
** Refer to Appendix 1, Section 2 Risk Rating – Table 3: Measures of Likelihood*
*^ Refer to Appendix 1, Section 2 Risk Rating – Table 1: Risk Matrix*
*+ Refer to Appendix 1, Section 3 Control Measures*

## Part III (Substances used)

Please list out chemicals, biological substances, animals to be used

| **Item Description** *(e.g. Name, CAS No., species, serotype)* | **Concentration/ Amount/Quantity** | **Controlled under Ordinance (Y/N)** |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

If chemicals are to be used in the experiment, have you read their MSDS and understood the potential hazard and associated precaution measures and safe handling procedures? **(Yes ~~/ No~~)**

## Part IV (Declaration section)

I hereby declare that the information provided above is to my best knowledge true, correct and complete.

| **Person Carrying Out The Risk Assessment** | | **Endorsed & Reviewed by PI~~/HoD/Dean~~** (i.e. Your supervisor) | |
|---|---|---|---|
| Signature | | Signature | |
| Name | | Name | |
| Date | | Date | |

**IMPORTANT:** Please retain and keep proper records. The approved form should be copied to the student / staff involved for them to observe the control measures and put them in place. Please submit a **signed form** with training record to MSE office by **online submission system for recordkeeping.**



**Please save the document and submit it via the online submission system (Click me)**

# Appendix 1: Risk Assessment Guidance Notes

## 1. Checklist of Potential Hazards and Corresponding Hazard Code

| | Hazard | Hazard code |
|---|---|---|
| * | Bodily burnt due to | |
| | • high temperatures (handling hot metal, high temperature operations, casting, etc.) | B1 |
| | • cold temperatures (handling cryogenic fluids, working in freezing conditions, etc.) | B2 |
| * | Bodily injury resulting from mechanical energy | |
| | • Cut by rotating shaft, mandrel | B3 |
| | • Cut by rotating cutters, (machine tools) | B4 |
| | • Cut by reciprocating die and tools, | B5 |
| | • Cut by in-running nips of gear, bearing, etc, | B6 |
| | • Hurt by moving object (e.g., robot arm) | B7 |
| | • others | B8 |
| * | Biohazard | |
| | • animals | B9 |
| | • microorganisms | B10 |
| | • bacteria | B11 |
| | • viruses | B12 |
| | • human clinical specimens | B13 |
| | • fungi | B14 |
| | • parasites | B15 |
| | • others (such as organ, tissue or cell culture) | B16 |
| * | Chemical Hazard | |
| | • flammables (such as acetone, methane, hydrogen) | C1 |
| | • toxic (such as chloroform, ammonia, cyanides) | C2 |
| | • corrosives (such as hydrofluoric acid) | C3 |
| | • peroxide forming chemicals (e.g. diethyl ether, tetrahydrofuran, 1,4-dioxane) | C4 |
| | • explosives (e.g. picric acid, perchloric acid, azides and perchlorate of heavy metals) | C5 |
| | • compressed gas | C6 |
| | • antibiotics, drugs, poisons | C7 |
| | • highly reactive chemicals (e.g. Pyrophorics, Self-heating / self-reactive substances, Substances which, in contact with water, emit flammable gases) | C8 |
| | • nanomaterials | C9 |
| * | Confined space hazard | C10 |
| * | Electric shock due to | |
| | • contact with exposed live component | E1 |
| | • use of high power/voltage source | E2 |
| | • design of own power source | E3 |
| | • others | E4 |
| * | Fire Hazard (e.g. use of flammables, open flame, overloading, short circuiting, etc) | F1 |
| * | Fall of person from height | F2 |
| * | Flying Objects | F3 |
| * | Hand tools | H1 |
| * | Heat Stress | H2 |
| * | Hit by falling object | H3 |

| | Hazard | Hazard code |
|---|---|---|
| * | Machinery | M1 |
| * | Manual Handling | M2 |
| * | Motor Vehicle | M3 |
| * | Noise ( ≥85 dB(A)) | N1 |
| * | Off Campus Activities | |
| | • handling of animals | O1 |
| | • insects/ticks/other biting organisms | O2 |
| | • illness or allergic reaction | O3 |
| | • dehydration | O4 |
| | • heatstroke | O5 |
| | • toxic substances | O6 |
| | • others (e.g. temperature extremes, altitude) | O7 |
| * | Others (please specify) | Others |
| * | Plant and Equipment | P1 |
| * | Portable Electrical Tools | P2 |
| * | Pressure Hazard | P3 |
| * | Radiation | |
| | - Non-ionizing radiation | |
| | • ultraviolet (e.g. UV lamp) | R1 |
| | • laser | R2 |
| | • very high radio frequency (>1G) | R3 |
| | • far infra-red (> 1um) | R4 |
| | • magnetic field (e.g. NMR, MRI) | R5 |
| | • others | R6 |
| | - Ionizing radiation | |
| | • alpha particles | R7 |
| | • beta rays | R8 |
| | • gamma and X rays | R9 |
| | • machine producing ionizing radiation | R10 |
| | • others | R11 |
| * | Sharp objects (e.g. needle) | S1 |
| * | Welding | W1 |

*(If you cannot find suitable hazard category from the above table, please put down "Others" in your form.)*

## 2. Risk Rating (R)

The Risk Rating is determined using the Risk Matrix below:

### Table 1: Risk Matrix

| **LIKELIHOOD** (How likely could it happen?) | **CONSEQUENCES** (How severely could it hurt someone?) | | | |
|---|---|---|---|---|
| | **Minor (1)** | **Moderate (2)** | **Major (3)** | **Catastrophic (4)** |
| **Rare (1)** | **L** | **M** | **H** | **H** |
| **Unlikely (2)** | **L** | **M** | **H** | **E** |
| **Likely (3)** | **H** | **H** | **E** | **E** |
| **Almost certain (4)** | **H** | **E** | **E** | **E** |

Legends: E = Extreme risk H = High risk M = Moderate risk L = Low risk

Evaluate the level of risk for each of the above hazards using the formula below as a guide:

**Risk Rating (R) = hazard severity (H) x likelihood of the hazard arising (L)**

*(where severity and likelihood can be estimated and quantified by using the Table 2 and Table 3 below respectively)*

### Table 2: Description of Hazard Severity (H)

| **Severity** | **Description** |
|---|---|
| Minor (1) | First aid treatment only, no lost work time |
| Moderate (2) | Casualty treatment |
| Major (3) | Serious bodily injury |
| Catastrophic (4) | Death, permanent disablement |

### Table 3: Measures of Likelihood (L)

| **Likelihood Scale** | **Description** |
|---|---|
| Rare (1) | Could occur but probably never will |
| Unlikely (2) | Could occur but rare |
| Likely (3) | Could occur occasionally |
| Almost certain (4) | Could occur often |

## 3. Control measures

All hazards must be addressed using the hierarchy of control measures in the following order of priority: elimination, substitution, isolation, engineering, administrative, personal protective equipment (PPE).

| | |
|---|---|
| 1st: | **Eliminating / substituting** the hazard giving rise to the risk with a hazard giving risk to a lesser risk, such as use of a safer machine, chemical |
| 2nd: | **Isolating** the risk by keeping the operator away from the hazard, such as provision of fixed guard, fume cupboard |
| 3rd: | Minimizing the risk by **engineering means** (redesign), such as provision of lifting equipment to reduce manual handling |
| 4th: | Applying **administrative measures**, such as limiting the exposure time |
| 5th: | Using adequate **personal protective equipment (PPE)**. |