|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Risk Assessment** | | | | |
| **Task/Activity** | Smallpeice Computing, Robotics & Electronics Summer School | | **Date** | 12-16 Aug. 2019 |
| **Unit/Faculty/Directorate** | Electronics and Computer Science | **Assessor** | Dr Thai Son Hoang | |
| **Line Manager/Supervisor** | Prof Steve Gunn | **Primary site/location** | Highfield Campus | |
| **Brief details/comments** | The summer school is run by the ECS department with assistance from Student Robotics Southampton and managed by the Smallpeice Trust. The participants in the summer school are teenagers in Year 12 (age 16–17), and are invited to design, build and test an autonomous robot in small teams. The robots must perform a simple task, usually involving locating and moving coloured boxes, which is performed competitively against other teams’ robots. The Smallpeice Computing, Robotics & Electronics Summer School 2019 will be held on the University of Southampton’s Highfield Campus from 12—16 August 2019. 80 students will be attending. During the week, there will be a University of Southampton ‘organisers’ (Dr Thai Son Hoang) and twenty four mentors from Student Robotics Southampton.  In addition to this main event, there are a number of taught laboratory sessions. Members of Student Robotics Southampton will mentor and provide assistance to the participants, as well as set up the arena for the competition and lead the laboratory sessions.  The summer school participants are to be supervised by DBS- checked staff from the Smallpeice Trust at all times. As a result it is not a requirement for ECS and Student Robotics Southampton staff to have DBS certificates; however it is still advantageous to have one. The supervision staff include trained first-aiders.  This risk assessment specifically covers the use of The Cube for assembly and use of an arena for the competition matches, as well as continuation of the construction of the robots. Manual and/or power tools will be used to assemble the arena and robot chassis, and lithium polymer batteries may be used inside the robots. | | | |

| ***PART A*** | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(1) Risk identification** | | | **(2) Risk assessment** | | | | **(3) Risk management** | | | |
| **Hazard** | **Potential Consequences** | **Who might be harmed**  **(user; those nearby; those in the vicinity; members of the public)** | **Inherent** | | |  | **Residual** | | | **Further controls (use the risk hierarchy)** |
| **Likelihood** | **Impact** | **Score** | **Control measures (use the risk hierarchy)** | **Likelihood** | **Impact** | **Score** |
| Fire | Burns and smoke inhalation, fatality | Mentors, Staff, Students | **1** | **5** | **5** | Local organisers will be familiar with fire alarm and evacuation arrangements for venues. Mentors to be made aware of arrangements and how to act in an emergency. Consideration must be given to arrangements for visitors with mobility difficulty. | **1** | **5** | **1** | Access to some areas must be restricted if necessary, these to be identified to all assistants. |
| Fire | Burns and smoke inhalation, fatality | Mentors, Staff, Students | **1** | **5** | **1** | Maximum capacities of venues must not be exceeded (check suitability of venues before event), tally of attendees to be kept and compared to published venue capacities. Helpers must be on hand to ensure all access/egress routes are kept clear and not overcrowded, splitting groups into manageable sizes. | **1** | **5** | **1** | Normal building access routes must be available (consider areas with lock-down out of normal hours). |
| Slips trips and falls | Impact and bruising | Mentors, Staff, Students | **3** | **1** | **3** | Good housekeeping to be maintained in all venues. All venues to be used by visitors will be inspected by local organisers before the event to ensure conditions are satisfactory. Consider weather conditions and ensure appropriate measures are in place. | **1** | **1** | **1** | E&F to be contacted to deal with wet floors, slippery paths etc. |
| Trips and falls | Impact and bruising | Mentors, Staff, Students | **3** | **1** | **3** | All areas to be kept clear of trip hazards. Stands and promotional materials must not obstruct access/egress routes. No trailing wires across walk ways, reroute or use cable covers. Checks made before event start by local organisers. | **1** | **1** | **1** | Spills to be cordoned off / marked as soon as they occur, Mentors to maintain watch until spill cleared. |
| Slips and falls | Impact and bruising | Mentors, Staff, Students |  |  |  | Any spills to be cleared up immediately (mentors to have access to spill clearance equipment or be aware of how to inform Domestic Services). |  |  |  |  |
| Manual Handling | Sprains and MSD | Mentors, Staff, Students | **3** | **3** | **9** | Staff/Mentors/Students to be provided with or be aware of trolleys etc. for moving heavy materials / equipment. All staff/mentors/Students to be briefed that they should not attempt to lift or move heavy objects without assistance | **1** | **3** | **3** |  |
| Manual Handling | Sprains and MSD | Mentors, Staff, Students | **3** | **3** | **9** | Due to space arrangements some teams will be required to frequently transport unwieldy items (their robots) between floors of the building. Elevators should be used for this when possible; in the event of elevator failure, extra caution must be taken when using the stairs. | **1** | **3** | **3** | All attendees to be made aware of the locations of the building’s elevators. |
| Personal injury / illness | Injury / Illness | Mentors, Staff, Students | **3** | **3** | **9** | Events on normal University working days will be adequately served by normal local first-aid cover. All mentors etc. are briefed on these arrangements, location of first-aid supplies and know how to summon assistance. | **1** | **3** | **3** | Request information on pre-existing medical conditions, and circulate to mentors. |
| Welfare | Illness | Mentors, Staff, Students | **3** | **1** | **3** | All normal toilet facilities to be available to visitors. Conditions in toilets to monitored and issues raised with E&F. | **1** | **1** | **1** | All mentors to be briefed on locations of WCs so they may direct visitors accordingly. |
| Ongoing building maintenance | Injury | Mentors, Staff, Students | **3** | **5** | **5** | Work with E&F and Faculty Resources Officer to suspend all non-essential building works during the Event where necessary. On-going work areas to be cordoned off and signed to prevent unauthorised access. | **1** | **5** | **5** | All organisers and mentors to be aware of restricted areas and to divert visitors accordingly. |
| Electrical | Burns and shock | Mentors, Staff, Students | **3** | **3** | **9** | Any use of electrical equipment other than standard (light fittings and basic installation) will be separately risk assessed. All equipment used to have been PAT tested.  Opened food and drink is prohibited in the vicinity of computers and robotics equipment. | **1** | **3** | **3** | Mentors check to take place before use, report concerns to local organisers |
| Chemicals, machinery | Contact with dangerous materials or equipment | Mentors, Staff, Students | **3** | **5** | **15** | Activities include access to laboratories which have had their own specific risk assessments held by the faculty Health and Safety office. | **1** | **5** | **5** |  |
| Vehicles | Injury | Mentors, Staff, Students | **3** | **5** | **15** | Reschedule deliveries etc. to avoid locations where large numbers of visitors are anticipated. Plan pedestrian routes to avoid crossing vehicle routes. | **1** | **5** | **5** | Where this is not possible endure, mentors are briefed and present to marshal and assist in safe passage. |
| Personal injury, illness, or illegal behaviour by students | Injury / Illness | Students | **3** | **3** | **9** | Students will be well monitored while on the University Campus, and engaged in activities.  All mentors have emergency contact details for supervisors/staff. | **1** | **3** | **3** |  |
| Students make allegations of inappropriate behaviour by staff, mentors | Students make allegations of inappropriate behaviour by staff, supervisors, mentors | Students | **3** | **3** | **9** | All staff and mentors instructed not to be one-on-one with students. | **1** | **3** | **3** |  |
| Interaction with autonomous robots | Minor injury if the robots move unexpectedly | Staff, Mentors, Students | **3** | **2** | **6** | Robots are only to be tested under supervision.  When robots are switched on, they will be treated as though they could become active at any moment.  The arena is to be supervised by a mentor at all times. Robots must pass a safety inspection before being allowed into the arena. | **1** | **2** | **2** | Staff will verify that the robotics equipment does not present any sharp edges. If any are found, they will be removed, covered, or otherwise modified to reduce the chance and severity of injury they could cause. |
| Lithium polymer batteries | LiPo batteries can ignite if dam- aged or misused, resulting in smoke/fire. | Staff, Mentors, Students | **3** | **3** | **9** | Boxes containing batteries are clearly labelled as such and will be handled with care at all times.  Batteries will be routinely inspected by staff for signs of dam- age or swelling, and set aside for safe disposal if necessary.  Batteries are only to be charged by trained staff. The battery charging procedure is to be followed at all times.  Batteries are only to be given to teams once their robot has passed a safety inspection by a member of staff. This inspection must check, among other things, that the robot’s battery compartment is rigid enough to resist damage to the battery. | **1** | **3** | **3** |  |
| Use of manual and/or power tools | Minor injury as a result of an accident or through improper use of tools. | Staff, Mentors, Students | **3** | **4** | **12** | Care will be taken with tools to ensure that minimal injury results in the event of an accident.  Power tools are only to be used by competitors while under supervision by a responsible adult. | **1** | **4** | **4** |  |
| Soldering | Burns through inappropriate use of soldering irons. Soldering may produce fumes which can lead to asthma. | Staff, Mentors, Students | **3** | **2** | **6** | All soldering irons are to be treated as if they are hot even if they are unplugged (since they may still be cooling down).  Soldering will only be permitted in rooms with appropriate ventilation.  Safety glasses are to be worn when soldering. | **1** | **2** | **2** |  |
| Useful contacts:   * *Domestic Services*: Billi-Anne Harris (Domestic Services Manager) ext. 22827 * *Estate & Facilities*: (Campus urgent requests)023 8059 7474 (ext. 27474) * *Organisers:* Thai Son Hoang 07474030359 | | | | | | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***PART B - Approval*** | | | | | |
| **Declaration by responsible manager:** I confirm that this is a suitable & sufficient risk assessment for the activities identified above and that all residual risks can be reduced to as low as is reasonably practicable. | | | | | |
| **Signed** |  | **Print name** |  | **Date** |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ***PART C – Action Plan*** | | | | | | | |
| **Risk Assessment Action Plan** | | | | | | | |
| **Part no.** | **Action to be taken, incl. Cost** | **By whom** | **Target date** | | **Review date** | **Outcome at review date** | |
|  | Check all the lecture theatres and facilities | Thai Son Hoang | 3/8/19 | | 3/8/19 |  | |
|  |  |  |  | |  |  | |
|  |  |  |  | |  |  | |
|  |  |  |  | |  |  | |
|  |  |  |  | |  |  | |
|  |  |  |  | |  |  | |
|  |  |  |  | |  |  | |
| Responsible manager’s signature: | | | | | Responsible manager’s signature: | | |
| Print name: | | | | Date: | Print name: | | Date |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ***PART D - Acknowledgement*** | | | | | | | |
| **Declaration by users:** I confirm that I have read this risk assessment, understand the controls outlined herein and will report to the responsible manager any incidents that occur or any shortcomings I find in this assessment. | | | | | | | |
| **Signed** |  | **Print name** |  | **Job Title/Student (UG/PGT/PGR/PHD)** |  | **Date** |  |
| **Signed** |  | **Print name** |  | **Job Title/Student (UG/PGT/PGR/PHD)** |  | **Date** |  |
| **Signed** |  | **Print name** |  | **Job Title/Student (UG/PGT/PGR/PHD)** |  | **Date** |  |
| **Signed** |  | **Print name** |  | **Job Title/Student (UG/PGT/PGR/PHD)** |  | **Date** |  |
| **Signed** |  | **Print name** |  | **Job Title/Student (UG/PGT/PGR/PHD)** |  | **Date** |  |
| **Signed** |  | **Print name** |  | **Job Title/Student (UG/PGT/PGR/PHD)** |  | **Date** |  |
| **Signed** |  | **Print name** |  | **Job Title/Student (UG/PGT/PGR/PHD)** |  | **Date** |  |
| **Signed** |  | **Print name** |  | **Job Title/Student (UG/PGT/PGR/PHD)** |  | **Date** |  |
| **Signed** |  | **Print name** |  | **Job Title/Student (UG/PGT/PGR/PHD)** |  | **Date** |  |
| **Signed** |  | **Print name** |  | **Job Title/Student (UG/PGT/PGR/PHD)** |  | **Date** |  |
| **Signed** |  | **Print name** |  | **Job Title/Student (UG/PGT/PGR/PHD)** |  | **Date** |  |
| **Signed** |  | **Print name** |  | **Job Title/Student (UG/PGT/PGR/PHD)** |  | **Date** |  |
| **Signed** |  | **Print name** |  | **Job Title/Student (UG/PGT/PGR/PHD)** |  | **Date** |  |
| **Signed** |  | **Print name** |  | **Job Title/Student (UG/PGT/PGR/PHD)** |  | **Date** |  |
| **Signed** |  | **Print name** |  | **Job Title/Student (UG/PGT/PGR/PHD)** |  | **Date** |  |
| **Signed** |  | **Print name** |  | **Job Title/Student (UG/PGT/PGR/PHD)** |  | **Date** |  |
| **Signed** |  | **Print name** |  | **Job Title/Student (UG/PGT/PGR/PHD)** |  | **Date** |  |
| **Signed** |  | **Print name** |  | **Job Title/Student (UG/PGT/PGR/PHD)** |  | **Date** |  |
| **Signed** |  | **Print name** |  | **Job Title/Student (UG/PGT/PGR/PHD)** |  | **Date** |  |
| **Signed** |  | **Print name** |  | **Job Title/Student (UG/PGT/PGR/PHD)** |  | **Date** |  |
| **Signed** |  | **Print name** |  | **Job Title/Student (UG/PGT/PGR/PHD)** |  | **Date** |  |
| **Signed** |  | **Print name** |  | **Job Title/Student (UG/PGT/PGR/PHD)** |  | **Date** |  |
| **Signed** |  | **Print name** |  | **Job Title/Student (UG/PGT/PGR/PHD)** |  | **Date** |  |
| **Signed** |  | **Print name** |  | **Job Title/Student (UG/PGT/PGR/PHD)** |  | **Date** |  |
| **Signed** |  | **Print name** |  | **Job Title/Student (UG/PGT/PGR/PHD)** |  | **Date** |  |
| **Signed** |  | **Print name** |  | **Job Title/Student (UG/PGT/PGR/PHD)** |  | **Date** |  |

**Assessment Guidance**

|  |  |  |  |
| --- | --- | --- | --- |
| 1. Eliminate | Remove the hazard wherever possible which negates the need for further controls | If this is not possible then explain why |  |
| 1. Substitute | Replace the hazard with one less hazardous | If not possible then explain why |
| 1. Physical controls | Examples: enclosure, fume cupboard, glove box | Likely to still require admin controls as well |
| 1. Admin controls | Examples: training, supervision, signage |  |
| 1. Personal protection | Examples: respirators, safety specs, gloves | Last resort as it only protects the individual |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **LIKELIHOOD** | 5 | 5 | 10 | 15 | 20 | 25 |
| 4 | 4 | 8 | 12 | 16 | 20 |
| 3 | 3 | 6 | 9 | 12 | 15 |
| 2 | 2 | 4 | 6 | 8 | 10 |
| 1 | 1 | 2 | 3 | 4 | 5 |
|  | | 1 | 2 | 3 | 4 | 5 |
| **IMPACT** | | | | |

|  |  |  |
| --- | --- | --- |
| Impact | | Health & Safety |
| 1 | Trivial - insignificant | Very minor injuries e.g. slight bruising |
| 2 | Minor | Injuries or illness e.g. small cut or abrasion which require basic first aid treatment even in self-administered. |
| 3 | Moderate | Injuries or illness e.g. strain or sprain requiring first aid or medical support. |
| 4 | Major | Injuries or illness e.g. broken bone requiring medical support >24 hours and time off work >4 weeks. |
| 5 | Severe – extremely significant | Fatality or multiple serious injuries or illness requiring hospital admission or significant time off work. |

Risk process

1. Identify the impact and likelihood using the tables above.
2. Identify the risk rating by multiplying the Impact by the likelihood using the coloured matrix.
3. If the risk is amber or red – identify control measures to reduce the risk to as low as is reasonably practicable.
4. If the residual risk is green, additional controls are not necessary.
5. If the residual risk is amber the activity can continue but you must identify and implement further controls to reduce the risk to as low as reasonably practicable.
6. If the residual risk is red do not continue with the activity until additional controls have been implemented and the risk is reduced.
7. Control measures should follow the risk hierarchy, where appropriate as per the pyramid above.
8. The cost of implementing control measures can be taken into account but should be proportional to the risk i.e. a control to reduce low risk may not need to be carried out if the cost is high but a control to manage high risk means that even at high cost the control would be necessary.

|  |  |
| --- | --- |
| Likelihood | |
| 1 | Rare e.g. 1 in 100,000 chance or higher |
| 2 | Unlikely e.g. 1 in 10,000 chance or higher |
| 3 | Possible e.g. 1 in 1,000 chance or higher |
| 4 | Likely e.g. 1 in 100 chance or higher |
| 5 | Very Likely e.g. 1 in 10 chance or higher |