

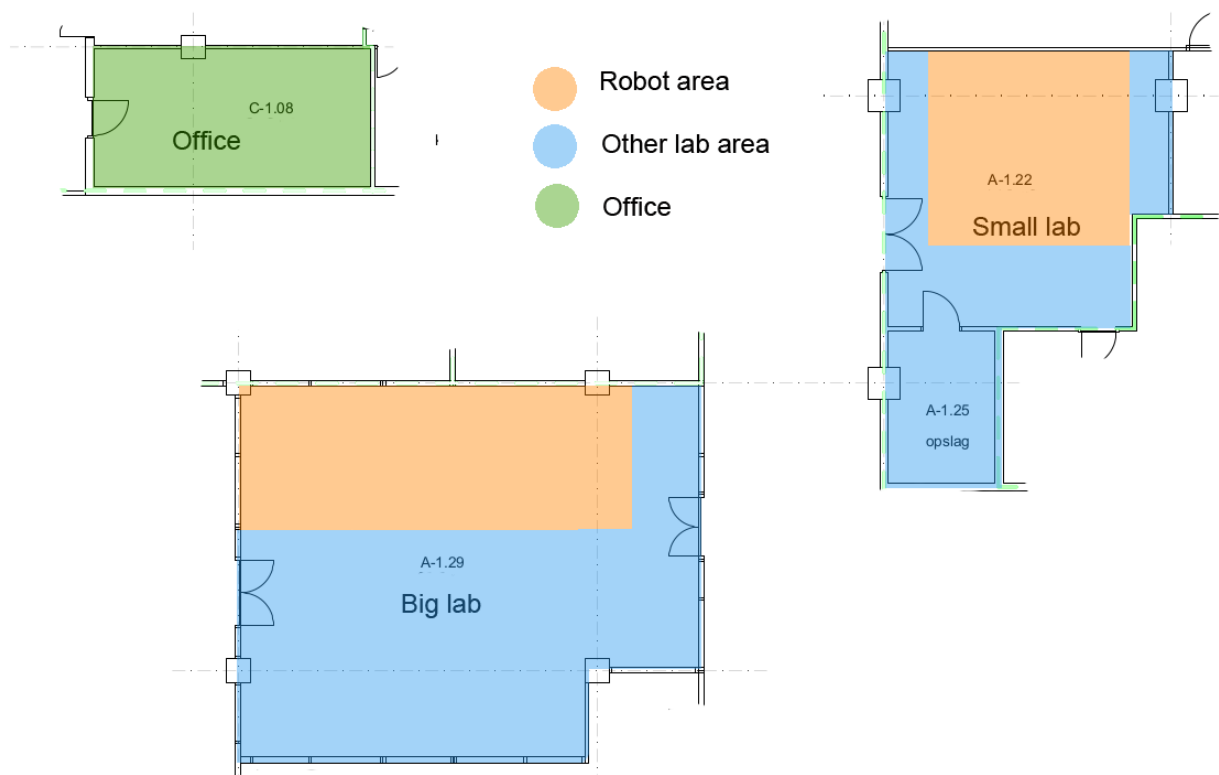
# Robot studio - Robotic labs – Lab rules

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The Digital Production/Robotic Research Group is working across several rooms. Working in these rooms is only possible if you follow certain rules and meet certain criteria. This is to ensure that the risks of getting injured are minimised (health and safety) and everyone is able to work in a pleasant and organised lab (mental health).

## Areas

We distinguish between three types of areas:



- The office is primary for staff and in some cases interns.
- The other lab areas can be used by staff, interns and students.
- Students can use the other lab areas during certain hours depending on the courses they follow. Outside regular course hours, students can only use these areas upon approval of a staff member.

The robot areas contain equipment that can be very dangerous in potential (like the robots for example). To ensure we keep these risks to a minimum there are several rules for these areas.

For the other lab areas and office area there are also rules, mainly to keep things nice and pleasant.

You must know these rules before you will be able to use any of the labs.

The lab supervisors (listed at the bottom of this document) will oversee all use of the labs and their instructions need to be followed.

### All areas

In all areas we have a clean desk policy. If you use a desk, make sure it is completely empty after you have used it or at the end of the day.

### Other lab areas AND robot areas

- Clean up your tools and materials at the end of your shift or end of the day.
- If you continue the next day and no one else is using it in between you will still have to tidy and clean your area. But you can leave some materials if they are orderly.
- Keep pathways clear of cables and objects for people to evacuate in case of emergency.





### Robot areas

- No food and drinks are allowed in the robot area.
- These areas cannot be used as material storage, so only bring what you need. This helps to keep the pathways clear (see other rule) and minimises fire hazards.

## Use of the robots

### 1. Get robot training and certification

Robots can only be used if you have the appropriate authorisation level and certificate to prove it.

	<b>AUTHORISATION LEVEL</b>	<b>PERMISSIONS</b>
	<b>Black glove</b> Advanced Robot Operator	Supervise and operate established processes and new processes
	<b>Green glove</b> Independant working robot operator	Unsupervised use of robots & equipment to do established processes
	<b>Yellow glove</b> Apprentice robot operator	Supervised use of robots and equipment
	<b>White glove</b> Others / visitors	No use of robots or equipment

### 2. Get process specific training for established processes

Some processes need additional training. Each established process has a process card where all required safety measures are described, and whether or not additional training is required.

### 3. Get approval for experimental processes

3a. Processes that are not established are experimental and need approval of a black glove supervisor before executing them. The black glove supervisor might require you to write a process card for the process if it doesn't exist yet. Or write a short project plan.

The short project plan should contain:

- names of the people that want to use the robot
- description of the process to be done by the robot
- description of the process specific hazards
- used tools, fixture methods and safety gear
- time planning including setup and cleaning

3b. The black glove supervisor that deals with your request will be your primary contact for the rest of your project. Any additional questions or reports should be preferably directed to this administrator.

#### **4. Get a timeslot**

4a. If you have the right authorisation level and training for an established process or got approval for an experimental process, you must obtain a robot timeslot to use the robot. The way of obtaining such a timeslot is outside of the scope of this document and this information should have reached you in some other way.

4b. Be aware, lab supervisors are not responsible for your deadlines, make sure you get your stuff organised in time and take into account that when you don't get permission (yet) to do your process you won't be using the robot.

#### **5. Locate safety related equipment before you start**

Before you start to do anything, locate in the room the following: emergency buttons, fire extinguisher and first aid kit.

#### **6. Person operating the robot is responsible for robot movement**

-When the robot is moving, no one is allowed in the robot operation area. The person holding the enabling device (flexpendant, teach pendant) is responsible for keeping the process safe and needs to be alert at all times. For some tasks (like finetuning positions) you want a close look while jogging. In that case, only the person holding the enabling device may be inside the robot working area.

#### **7. All robot operations should be performed in reduced velocity mode**

All robot operations should be performed in Manual Mode / Manual Reduced Velocity Mode T1. If you require automode after testing in manual mode, a lab administrator must approve first.

#### **8. Wear personal protection equipment**

Wear the personal protection equipment associated with your process while doing the process.

Also be aware of loose clothing/jewelry/hair or anything that could be caught by moving/spinning machines.

Wear proper shoes (no flip flops or anything down that line) and wear safety shoes if needed. The robot studio has overalls available to protect your cloths from any dirt or damage. The robotlab is not responsible for your clothing, please wear the overalls when you want to keep your cloths neat.

#### **9. Emergency stop button must stop all end-effectors**

When you connect 230V devices to the robot, they also need to be connected to the emergency button system of the robot.

#### **10. Report incidents**

Any incident, malfunction, collision or other abnormalities should be reported to the lab administrator. Either instant, or for some less urgent matters the same day.

## 11. Clean up

There are already some directions on how to leave the areas after use. This rule zooms in a bit further on robot use.

After robot use, everything should be cleaned up and returned to a neutral and clean state.

This includes, but is not limited to:

- End effectors should be removed from the robot and placed back to where they belong
- All tools should return to their original place (tools from other workshops must return there)
- All leftover materials must be cleaned
- Your project must be removed

For certain projects special storage is available for materials. Ask your supervisor in case of doubt. If you fail to leave the robot area empty, you have no guarantee that your stuff will be kept.

## 12. Failure to follow the rules can lead to a ban

In case you fail to follow the rules you will get either:

- a warning
- a ban from robot use until certain criteria are met
- a definite ban from robot use

What exact measures are taken will depend on the severity of the situation and whether warnings have been issued before. Decisions on this are taken by black glove supervisors.

## Additional remarks

-Industrial robot arms can be very powerful, even at low speeds. The robot can make unexpected movements as for instance a stop may be followed by a rapid movement. External signals can initiate robot movement without warning.

-Yellow glove robot operators must simulate all robot moves (in Robotstudio, RoboDK, Rhino, ROS,...) before running them on the robot. Be aware that a perfect simulation is impossible, so when running the code, pay close attention to unsimulated components like fixtures, work surface etc.

## Contact details

Black glove supervisors:

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In some cases (specific courses)

Richard	<a href="mailto:r.a.lekkerkerker@hva.nl">r.a.lekkerkerker@hva.nl</a>	06 1535 4191
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# Safety Policy Acknowledgement

The Robotstudio of the Amsterdam University of Applied Science has labrules to minimise risks during labwork and to create a safe work environment for all involved.

By signing below, I acknowledge:

- That I was given a copy of the labrules on paper or digital to read
- That I have fully read and understood the safety policies and procedures in its entirety
- That before signing this document I had a chance to ask additional questions in case of uncertainty or raise any other issue

**Name:**

**Date on the safety rules that I read:**

**Date today:**

**Signature:**