

Safety and Environmental Manual for the HCI

Version 2024 - Brochure



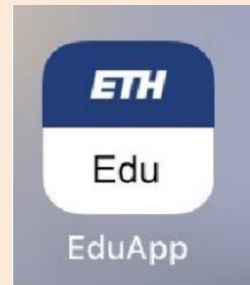
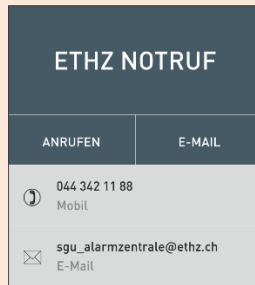
März 2024 / Thomas Mäder

Emergency / Alarm 888 / Evacuation

Emergency Alarm (all types, 24/7): Tel 888
(valid for all ETH internal telephones)

Emergency Desk via cell phone or external lines (24/7): 044 342 11 88


Save the Emergency Desk in your cell phone with the QR code:



Note: The **EduApp** is an interactive smartphone application for studying and teaching at ETH Zurich. You can also use the EduApp to make an emergency call.

Look → Think → Act

1. Secure danger area, protect yourself
2. If possible, always leave the patient on site (the first aid team will come on site)



Where? Place of accident (building, floor, room)
What? Type of accident
Who? Name of alerting person and how to contact
When? Time of accident
How many? Count of patients (and their injuries)
Other? Additional potential risks

Additional emergency phone numbers:

Generally, always alert via 888 or 044 342 11 88. Use the following numbers only if communication with the Emergency Desk is not possible. Enter the phone number exactly as indicated:

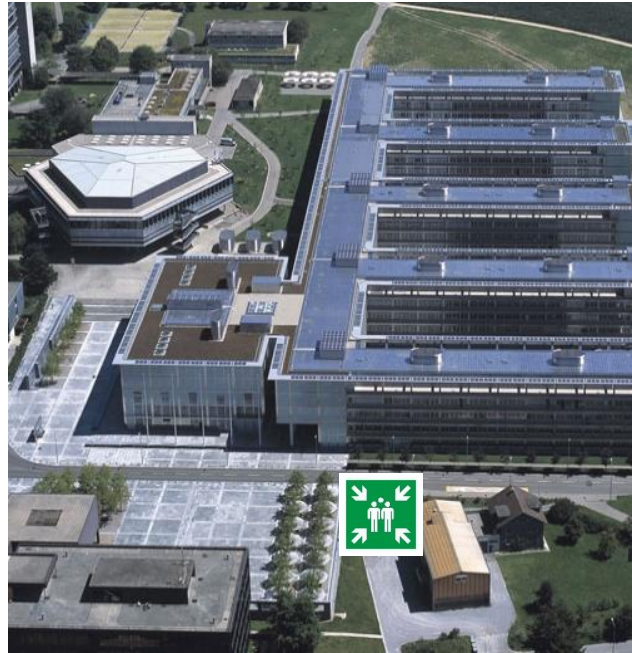
	For all ETH internal telephones	Cell phone
Police	0117	117
Fire brigade	0118	118
First Aid	0144	144
Tox Info Suisse	0145	145

Building evacuation and assembly point

In an emergency, users can request an evacuation of the building via the Emergency Desk based on their assessment. If a siren sounds over the loudspeaker system, or you receive a corresponding message (email and SMS) via IAT (information and alarm tool) in connection with the call for building evacuation, immediately go to the assembly point HXE via escape route (see illustration on the right).



Follow the instructions of the safety personnel.



Please also refer to the brochure "How to Play it Safe at ETH Zurich". You can download the brochure from the website of the SSHE Department.

For further information see also

www.sgu.ethz.ch




















QR code for the complete online version of the Safety and Environmental Handbook for the HCI Version 2024

The Safety and Environmental Handbook for the HCI Version 2024 applies to all employees and students within the HCI building. This manual replaces the previous versions.



1. The most important rules in the workplace

<p>Duty!</p> 	<p>All employees and students must behave in a safety and environmentally conscious manner! All new arrivals are personally instructed in safety and the environmental matters by the safety officers/assistants who are authorized to give instructions. Newcomers undertake to follow and comply with safety and environmental guidelines.</p>
<p>Personal protection!</p> 	<p>When working with chemicals and equipment, the use of personal protective materials (available in the HCl shop) is mandatory; 1st priority: Safety glasses that fit well and lie close against the face! Wearing contact lenses is not permitted. Suitable protective goggles are required for those who wear glasses. People who wear glasses and are employed at ETH can apply to the SSHE department for prescription safety glasses.</p> <p>It is also mandatory to wear a laboratory coat over laboratory-suitable street clothing, consisting of flame-retardant, non-melting textiles. This also includes long trousers and sturdy, closed shoes. If necessary, personal protective equipment must be supplemented with work gloves, respiratory protection, etc.</p>
<p>Workspace!</p> 	<p>Generally, users must keep the workspaces and fume hoods clean and tidy. Everyone who works in a laboratory is responsible for good work hygiene. Workspaces and fume hoods may not be cluttered with chemicals.</p> <p>The SE management can block unacceptable workplaces.</p> <p>Chemicals or objects contaminated by chemicals must be kept away from the laboratory writing areas.</p>
<p>Forbidden!</p> 	<p>Foodstuffs of all kinds, cosmetics and medicines must never be consumed, used or stored in the laboratory zone or in the immediate vicinity of chemicals, biologically active substances or hazardous equipment. Smoking is strictly prohibited in the entire building.</p> <p>Writing zones not separated by glass walls or something similar are considered as laboratory zone.</p>
<p>Contamination!</p> 	<p>After working with disposable protective gloves, always dispose of them at the place of use! Never walk around the building wearing gloves or with chemically contaminated utensils! People wearing work gloves will not be served by the service areas! Laboratory coats must not be worn in offices, toilet facilities, seminar rooms, cafeterias, etc.!</p>
<p>Risk Analysis!</p> 	<p>When working with chemicals or biologically active substances that pose an increased safety risk, the safety officers or assistants must be informed beforehand. Interns, students, apprentices, service staff, etc. require the immediate presence of a knowledgeable supervisor. A hazard/risk analysis must be carried out before starting work involving increased risk.</p> <p>Please note safety data sheets (SDS), as well as pictograms on the chemical labels and the GHS H/P phrases (danger/safety instructions).</p> <p>Link to websites:</p> <p>www.msds.com (registration required)</p> <p>www.reaxys.com</p> <p>If safety data sheets are not available, all possible risk factors that could be related to the unknown substance must be considered. Please note the following principle: The smaller the quantities of reactants and products used in the experiment, the smaller the extent of possible incidents or accidents.</p> <p>Special Toxlabs are available for dangerous work after consultation with the Safety Officers or assistants.</p>
<p>Sources of Ignition!</p> 	<p>Open fires or ignition sources (e.g. Bunsen burners with or without gas cartridges, hot air blowers) are only tolerated in rooms where there are no flammable and/or fire-promoting chemicals in the immediate vicinity.</p> <p>Alkaline metals and their hydrides can spontaneously ignite when exposed to air and water. Caution is required with distillation residues that contain alkali metals.</p>

<p>Volatiles!</p> 	<p>Work involving the use or release of toxic, flammable and malodorous chemicals, gases, aerosols or vapors, must be carried out in suitable laboratory fume hoods. Additional absorption devices must be installed to capture any escaping gases, vapors and aerosols.</p>
<p>Overpressure!</p> 	<p>Vacuum, overpressure, and agitation in unsuitable glassware pose a risk of bursting! Pay attention to the respective glass qualities and glass wall thicknesses of the containers and appliances. Check them regularly for damage (cracks, fissures, "little stars"). The operation of experimental autoclaves (must be equipped with a pressure gauge and bursting disk) with a pressure content product >10 [bar x l] requires the approval of the SSHE department or can be carried out in the high-pressure laboratory, depending on space requirements.</p>
<p>Prevention!</p> 	<p>Emergency plan: Always have an emergency plan ready that allows you to act quickly and correctly in the event of an incident or malfunction. Before starting an experiment, all protective measures must be taken (if necessary, suitable intervention materials must be provided) to prevent an event from occurring. This also means that the spread of smelly chemicals is prevented!</p>
<p>Gas cylinders!</p> 	<p>Gas cylinders must always be secured against tipping over, e.g. by chaining them to a wall bracket. Gas cylinders and compressed gas outlets require suitable reducing valves. Corroded or damaged reducing valves may no longer be used. The storage of spare gas cylinders that are not immediately used is not permitted. Please also note the binding gas guidelines on the website of the SSHE department.</p>
<p>Liquid gases!</p>  	<p>In addition to the risk of suffocation and cold burns with liquefied gases, attention must be paid to the following: Caution with oxygen enrichment in liquid nitrogen, especially in cold traps of high vacuum systems. When air is supplied, cold traps cooled with liquid nitrogen may be enriched with highly oxidizing liquid oxygen. This can react violently with condensed solvents during thawing. Never close Schlenk flasks, ampoules (or similar vessels) with substances that are frozen out under argon as a protective gas with liquid nitrogen in the cold. There is a high risk of overpressure explosion when thawing any liquid argon that may have condensed in a closed container.</p>
<p>Radioactivity!</p> 	<p>All work involving a risk from ionizing radiation requires a prior authorization (FOPH, SSHE) and must be carried out in specially designated isotope laboratories. In the HCI building, work with radioactive substances that are below the authorization limit must be approved by the SSHE department.</p>
<p>Doors and Escape routes!</p> 	<p>Laboratory, escape balcony, escape and building entrance doors must not be blocked with objects or wedged before closing. This guarantees the building ventilation balance and a slight negative pressure in the laboratory area, which makes it easier to contain and combat incidents. In the event of an emergency, work must be stopped and the laboratory left until the event that caused the emergency situation has been eliminated! There is also a risk that unauthorized people, as well as animals such as mice, insects, etc., can enter the building through open balcony doors on the ground floor and basement. The SE management will remove and dispose of any objects deposited on the escape routes or escape balconies.</p>
<p>Consideration!</p> 	<p>The use of headphones or sound systems that block outside noise increases the risk of accidents. Sound/radio devices may only be operated with the permission of the superior and may only be noticeable in the immediate personal environment. If there is unacceptable noise and disco conditions, the SE management can dismantle and remove the systems. Anyone who does not hear the alarm because they are wearing head sets and headphones is responsible for this.</p>
<p>Mass emails!</p> 	<p>The use of mass email addresses for personal purposes (e.g. market exchange) is prohibited!</p>

Important note: Further explanations of the most important rules in the workplace, as well as other important operating regulations, can be found in the chapters of the safety and environmental manual for the HCI version 2024.

2. Responsibilities in the HCI building

2.1 ETH Zurich ETH Zurich

The website www.ethz.ch not only presents ETH Zurich with its departments and research groups, it also shows all the links to service and administrative groups.

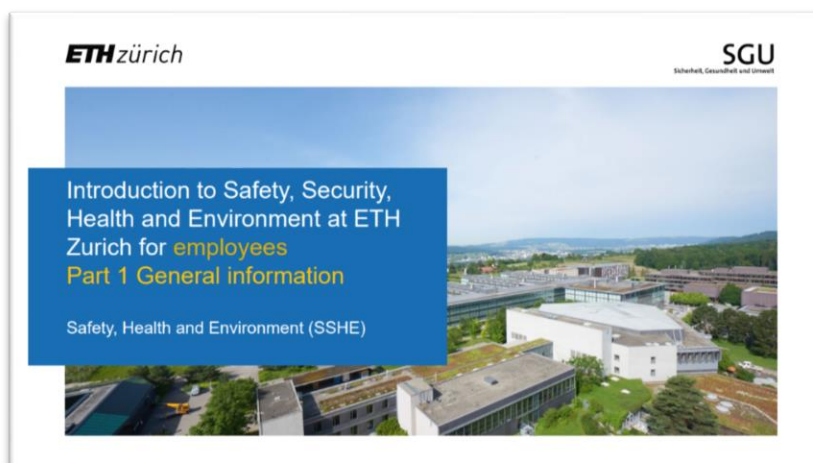
2.2 Safety, Security, Health and Environment (SSHE) department at ETH Zurich

The Safety, Security, Health and Environment (SSHE) department at ETH Zurich provides advice and support to all ETH members on safety, health and environmental protection issues. To this end, SSHE offers numerous training and continuing education courses for ETH members on occupational safety topics as well as special training and courses on special functions (group safety representatives, biosafety officers, etc.).

All ETH members must demonstrably know and observe the safety principles and the safety aspects specifically relevant to their work and studies. With the training module "Safety and Security at ETH Zurich", all members of the various target groups at ETH Zurich are trained in the basics. Employees with special functions can find information on the necessary safety training and further contact points at SSHE.

Detailed information can be found on the website of the SSHE department at www.sgu.ethz.ch.

The training module «Safety and Security at ETH Zurich» comprises part 1, presentation and part 2, knowledge query, as well as part 3, useful and further information.



2.3 KOORAS

The Coordination for Occupational Safety (= KOORAS) working group deals with safety and environmental issues that are specific to the HCI building. This supports the implementation of uniform safety and risk management in the HCI building.

KOORAS is headed by the professor delegated for safety at D-CHAB. Members of this committee are persons from the SU management of a department (see chapter 2.4) or a service platform located in the HCI building, as well as the institute safety representatives of the institutes. The KOORAS working group is administratively managed by the SU management of D-CHAB. KOORAS is supported by specialists from the SSHE department.

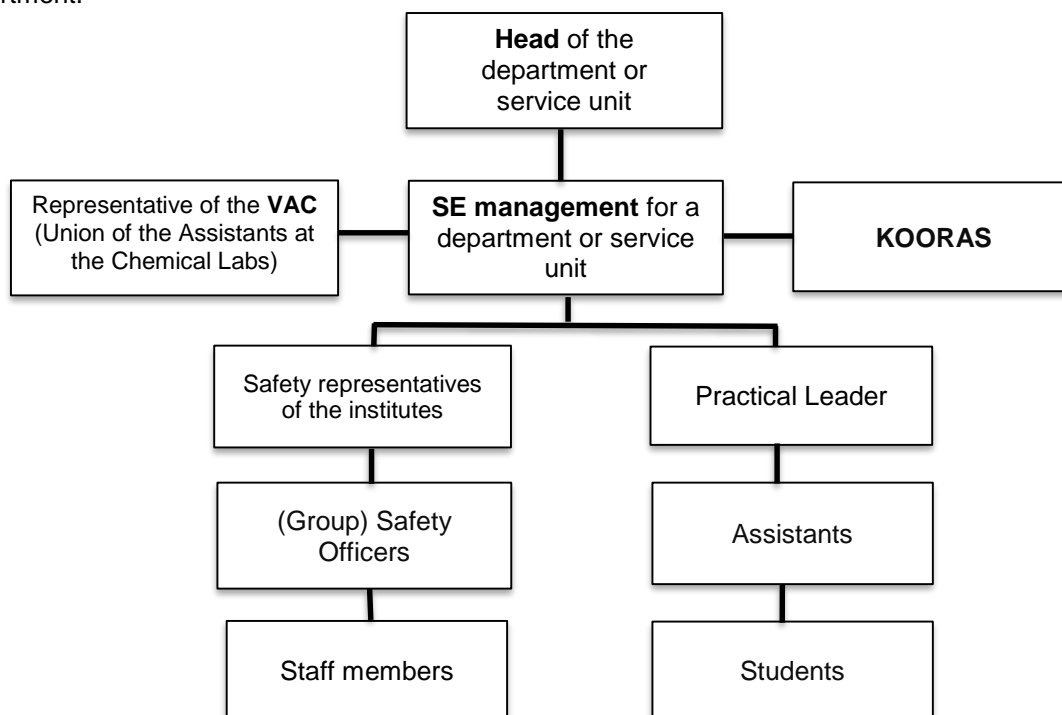
2.4 Safety and environmental management D-CHAB (SE management)

2.4.1. Initial situation

The SE management of a department or a service platform is a body appointed by the respective head with the basic task of adequately implementing the ETH safety, health and environmental policy. It acts in accordance with the guidelines of the SSHE department and the KOORAS working group.

2.4.2. organizational structure

The organizational structure shown below (= militia system) is applied analogously in the departments and in the service platforms in the HCI. The SE management of the D-CHAB processes and manages in particular the business decisions of the KOORAS throughout the HCI in cooperation with the SSHE department.



Website: www.su-management.ethz.ch; E-Mail: chab-safety@chem.ethz.ch

2.5 The services of the SE management D-CHAB for the HCI

2.5.1 Training concept

Overview of the training concept and examination requirements:

Who it concerns	Required training basis	Responsible authority	Duty to examine	Authorization
All employees and students in the HCI	Training module "Safety at ETH Zurich"	SSHE	Knowledge query on the training module "Safety at ETH Zurich"	Being allowed to work in the HCI
	Brochure on the safety manual for the HCI, instructions from the safety officers & practical leaders	SE-Management D-CHAB		
Laboratory staff, auxiliary assistants & practical assistants	Safety Manual HCI, Safety Lecture & Safety Lecture Practice Modules	SE-Management D-CHAB	Safety Lecture – exam Chemistry or Biology (free text)	To be able to work in the laboratories and/or as an assistant in the HCI practicum
Head Teaching Assistants & practical leader, (Group) Safety Officers	ASGS course of the SSHE department (2 days)	SSHE See course calendar	None	To be able to work as a safety officer or practical leader in the HCI
	Safety Manual HCI, Safety Lecture & Safety Lecture practice modules, Safety Officer course (= day course from SE Management)	SE-Management D-CHAB	Under discussion: Examination obligation	

2.5.2 Safety Lecture and Safety Lecture practical modules

The **Safety Lecture** is currently divided into 6 topic sections and the **Safety Lecture practical modules** into 3 topic sections. The topic sections can be further subdivided and supplemented as required. The aim of the Safety Lecture is primarily to teach the methodology for creating risk assessments, to explain our emergency organization, to provide basic knowledge about safety, and to explain the causes of accidents in relation to incident statistics. The Safety Lecture is always given as a live lecture shortly before the start of the semester, but it can also be studied or attended online as a PowerPoint presentation, illustrated with video clips, on our SE management website.

The **Safety Lecture practical modules** were created, among other things, as preventive measures based on incident statistics and the analysis of their causes. The practical modules focus on working methods that often lead to accidents.

2.5.3 Safety Lecture – Exam (via the Moodle examination platform)

The **Safety Lecture exam is mandatory for all persons working in laboratories, and for all assistants working in the practical labs at the HCI**. The Safety Lecture exam (either in German or English) must be taken under supervision and passed by all persons, including doctoral students, postdocs, assistants, but also visiting scientists, who work in laboratories and intend to work with chemicals and biologically active substances. This does not apply to staff in the administration and service units, or all students. The Safety Lecture exam contains 10 questions (random generator), which must be answered in free text in a maximum of 30 minutes. Each answer is worth 2 points. The documents on the SE management website are used for preparation.

The Safety Lecture exams are regularly evaluated in batches approximately every 10 days by an expert from SE Management D-CHAB who inform graduates of the result via the Moodle platform. Graduates who have not passed the exam are allowed to repeat it after a one-week break. The supervisors, safety officers and lab practical supervisors are responsible for monitoring the implementation of the examination obligations. A passed examination is valid for 5 years and must then be renewed.

What rules must be followed when taking the Safety Lecture exam?

- Each graduate may take the examination on their personal PC under the supervision of a safety officer. However, examination questions may not be answered using copied text passages.
- Internet access to our SE Management website is permitted during the exam, but not the use of any kind of «artificial intelligence». It is also not permitted to access any «documented exam questions with predefined answers».
- Colleagues or other persons may not help with the exam, nor may exam questions be copied and passed on.

What should I do if someone has not passed the Safety Lecture examination?

Graduates who have failed both attempts must inform their supervisor. As a rule, the managing professor will decide how to proceed.

2.6 Responsibility and specifications

2.6.1 Employers/professors

Supervisors can find an overview of their duties in the area of occupational health and safety and other important information on the SSHE website (see www.sgu.ethz.ch > SSHE Services > Information by target group).

The most important things in brief:

- **The employer or the leading professors are responsible for occupational health and safety at the workplace and in the laboratories.**
- He/she must take appropriate safety measures to ensure that the life and health of employees are not endangered.
- The employer bears the corresponding costs for all safety measures.
- The professors or supervisors are responsible for checking that all employees in the group have completed the necessary safety training and the required safety tests.

2.6.2 The employees/students

Employees and students are obliged to follow the instructions of the employer and the professors, to follow the safety regulations and to use safety devices and personal protective equipment correctly. They will find important information on the SSHE website (see www.sgu.ethz.ch > SSHE Services > Information by target group).

2.6.3 The SE manager of a department or service unit

- He/she supervises, processes and manages the entire SE management administration at departmental level or within the service unit.
- He/she coordinates and supervises the safety officers of the institutes and service units within his/her area of responsibility. Together with them, he or she carries out regular safety inspections. Any safety deficits and breaches of regulations identified are reported to the responsible managing professors.
- He/she takes part in the KOORAS meetings and implements the business decisions made there.

2.6.4 Safety for the Lab practical's in the HCI

The responsible head supervises and manages the entire practical safety administration in the HCI building in accordance with the duties set out in 2.6.3. The responsible Practical Leader coordinates and supervises the Head Teaching Assistants in the HCI, organizes a practical seminar with them once a year and regularly carries out safety inspections in the practical laboratories.

E-Mail: praktika-safety@chem.ethz.ch

2.6.5 Safety Representatives of the institutes and service units

The institutes and service units need a contact person for safety and the environment. The responsible supervisors or management levels appoint a safety officer for this purpose and confirm their appointment and the associated tasks with their signature. They provide them with the necessary working time. The training of these safety officers is carried out by the SE management D-CHAB.

The tasks of these safety representatives are:

- Instructing and supervising the Safety Officers within their area, possibly also those adjacent to the department or institute area (e.g. teaching laboratory, high-pressure laboratory, SwissCat+, workshop, etc.).
- The safety officers carry out regular safety inspections together with the SE Manager D-CHAB. Any safety deficits and breaches of regulations identified are reported to the responsible managing professors.
- Informing, advising and controlling within their responsible areas, as well as processing and forwarding suggestions and complaints.
- They take part in the KOORAS meetings and implement the business decisions made there.
- If necessary, they provide support to the SSHE department in dealing with incidents.

2.6.6 (Group) Safety Officers and Assistants

Every unit and every practical require a contact person for safety and the environment. The responsible supervisory level appoints (group) safety officers and Assistants.

The managing professors must ensure that the safety officers or assistants delegated by them are not forced to perform their safety activities and that they well motivated to carry out their duties. On the website of the SSHE department, the safety officers can find all important information on their tasks, which are summarized in a specification of duties.

Additional tasks of the safety officers and assistants in the HCI are:

- Personal introduction and training of new employees/students in the areas of safety and the environment. The document **Guide for Safety Introduction of New Staff & Students at HCI**, which can be downloaded from the SE Management D-CHAB website, forms the basis for the safety introductions to be carried out in person. The aim of the personal induction and training of new employees/students is to ensure that they cannot say "I didn't know that, I wasn't informed about it!" in the event of an incident.

- Controlling whether the new employees/students pass the mandatory safety test or have completed and passed the Safety Lecture exams.
- Ensuring that new staff/students have correct personal protective equipment. They check the fit of their safety glasses especially for new employees/students and make them aware of the dangers of open gaps between the edge of the glasses and their face.
- Informing and communicating the group-specific safety guidelines and instructions.
- Advising employees and students, as well as processing and forwarding risk assessments, suggestions and complaints to chab-safety@chem.ethz.ch.
- They draw up/maintain an emergency plan for their responsible area, which states how staff should proceed in the event of an emergency or crisis and which group-internal alarm chain will be used (see also Chapter 4 in the online edition).
- Recording and reporting incidents to the SSHE department as specified under 4.4 in the online edition.
- Personnel interview: The professors in the D-CHAB must conduct a personnel interview with their safety officers at least once a year. This is intended to give the safety officers a higher status and better support.

2.6.7 Obligation to supervise during laboratory practical

Definitions:

All practical courses in general, organic, biological, physical, pharmaceutical and analytical chemistry in which students are taught the basics of general laboratory work and the handling of chemicals or biologically/pharmaceutically active substances are considered **beginner practical courses**.

Chemicals, glass devices under vacuum or overpressure, special physical, biological, pharmaceutical and chemical experiments pose a danger to users if they lack training and experience. In the practical course for beginners, the risks lie mainly in the students lack of knowledge and inexperience in practical work. Therefore, special emphasis must be placed on good supervision in theory and practice. Only manageable and safe experiments should be carried out in the practical course for beginners.

Basic practical courses are those that are carried out before the student complete their Bachelor's degree. If the risk of danger can be proven to be low, the practical supervisors decide whether a basic practical course can be classified as a beginner or as an advanced practical course.

Advanced practical are those in which a certain basic knowledge of theory and practice is required to carry out the experiments. The students must be able to carry out the planned experiments with high quality and safety. In the advanced practical course, students can apply the basic previously acquired knowledge to research-related experiments, which shifts the risks to their correct execution and adherence with the safety concept.

Duty of supervision:

The assistants ensure that the duty of supervision is fulfilled during their practical course as listed below. The assistants must be familiar with current laboratory regulations and act accordingly. Before the start of a practical course, the assistants must give the students a personal safety introduction and discuss the training program and the resulting hazards with them. Students are not allowed to work alone in the practical laboratory. After the end of the work, the assistants carry out a final check in the practical laboratory and ensure that all media and equipment are securely in operation or switched off. After the final check, the practical laboratory is closed.

- Duty of supervision in the **beginners practical course**: At least one assistant must be present in the practical laboratory at all times during the entire practical period. A deputy must be able to be summoned immediately if necessary.
- Duty of supervision during the **basic practical course**: The practical supervisor can decide whether the duty of supervision can be reduced if the risk of danger is low. Otherwise, the same regulations apply as for the beginner practical course.

- Duty of supervision during the **advanced practical course**: The practical supervisors can decide whether an assistant must always be present in each practical room during the entire practical period, or whether this can be waived if the risk of danger is low. The prerequisite for waiving this is that an assistant located in the HCI building can be called immediately at any time (telephone/pager).

Fact: Where safety officers and assistants fulfill their duties and where superiors assume their responsibility and set an example, the risk and probability of accidents is significantly lower!

3. Safety Equipment

3.1 Emergency niches in the corridors of the HCI building

The emergency niches are located at regular intervals in all corridors of the HCI building. They contain two CO₂ hand-held fire extinguishers, a retractable fire hose (water), fire blanket, fire-fighting sand, full-body shower, eye shower, telephone (limited emergency power supply), fire alarm button and a small first-aid kit. A used or missing first aid kit can be reported via the reporting portal.



3.2 Escape balcony/balcony doors –terms of use

Note: Balcony and laboratory doors must never be left open. It is forbidden to enter the escape balconies in front of the practical laboratories (except in an emergency).

It is permitted to stay on the escape balcony (with the exception of practical laboratories) if the escape balcony door is closed behind you. The escape balcony doors must not be left open or wedged open with any objects. Closed balcony and laboratory doors ensure the building ventilation balance and a slight under-pressure in the laboratory area, which makes it easier to contain and combat incidents. The escape balcony serves as an escape route in emergency situations. Therefore, it is important that the balconies are kept clear of objects that might block the escape route.



3.3 Emergency Cabinets

An emergency equipment cabinet is available for each finger building HC1 - HC5, each located in the side corridor on a specific floor. A box is installed on the wall next to the respective cabinet, where the key is deposited behind a viewing glass which is best smashed with an object in an emergency. This means that initial intervention materials are permanently available to everyone in the HCl around the clock.

The basic range of an emergency equipment cabinet includes:

- 2 gas masks; Note:
 - o These are only suitable for instructed persons
 - o Filter masks are not suitable for all gases/vapors
- Protective suits
- Chemical-resistant and heat-resistant protective gloves (note resistance list!)
- First aid box with first aid instructions
- Anti-hydrofluoric acid kit, Hexafluorine eye wash bottle and hydrofluoric acid absorber material
- Civil defense rugs
- Foil rescue blankets
- Various chemical absorber materials for all kinds of spills
- Fluid barrier
- Barrier tape
- Orange box containing Diphotérine eye wash bottles and Diphotérine spray
- Nano-ex - protective cream
- Depending on your needs, workgroup-specific materials

The basic range in the emergency cabinets can be expanded as required by the safety officers.



Locations of emergency equipment cabinets:

- HC1: In the middle side corridor of the open-plan laboratory D118
- HC2: In the side corridor before D212
- HC3: In the side corridor before D312
- HC4: In the side corridor before H412
- HC5: In the side corridor before F512

Major events: Chemical Intervention Team (CIT)

If the incident cannot be resolved safely by the laboratory users themselves, the Emergency Desk must be alerted immediately. The chemical intervention team can then be called out during the day (or the fire department at night and on weekends).