General Laboratory Safety Rules at the School of Engineering

February 19th, 2025

Applies to	**all laboratories at the School of Engineering, excluding computer rooms**
Responsible members of staff:	**laboratory supervisors at the respective facilities**
Legal basis:	**§ 2 section 1 sentence 7 of the House Rules**

Contents

General Laboratory Safety Rules

1. Scope and legal basis

These General Laboratory Safety Rules apply to all employees working in and to anyone using the laboratories at the School of Engineering at htw saar. These rules are based on the statutory occupational health and safety regulations and relevant accident prevention regulations, as well as on the official guidelines "Working Safely in Laboratories: Fundamentals and Practical Guidance" (*"Laborrichtlinie"*), the German Ordinance on Hazardous Substances (*GefStoffV*), and on other generally recognized rules governing occupational health and safety, occupational medicine and hygiene, and other relevant findings from human factor studies.

The General Laboratory Safety Rules set out the general rules of conduct in the laboratories at the School of Engineering, identify general hazards and lay out the procedures to be followed when working with hazardous substances. The rules shall be supplemented by additional information and standard operating procedures relating to specific workplaces or specific activities. This supplementary documentation shall be provided by the relevant laboratory supervisor and shall be based on the results of appropriate risk assessments.

For the purposes of this document, the term "unit" shall mean the relevant organizational units within the School of Engineering. For the purposes of this document, the term "laboratories" or "labs" shall mean the laboratories and measuring and testing rooms in which courses are held and experiments are carried out. Computer rooms are treated like lecture halls and seminar rooms and are not covered by these rules.

The General Laboratory Safety Rules, supplemented as necessary by specific standard operating procedures, shall be easily accessible and/or displayed in the respective laboratories.

2. Personnel responsibilities

The Dean of the School of Engineering shall delegate responsibility for the safety of all persons legitimately engaged in activities in the respective laboratory to the relevant laboratory supervisor. The laboratory supervisor shall ensure that all persons working in the respective area are acquainted with the General Laboratory Safety Rules and that they observe and comply with the relevant requirements. This delegation of laboratory supervisors must be made in writing.

Prior to beginning work in a laboratory and at least once a year thereafter, or more regularly where appropriate, lab personnel, students and interns shall receive an oral activity- and workplace-specific safety briefing from the laboratory supervisor that covers laboratory hazards and the precautionary measures to be taken to prevent them. University management is responsible for briefing cleaners on safety issues. All new members of lab staff must be briefed before starting work. The laboratory supervisor and the person(s) being briefed shall each keep records of all safety briefings conducted. These records are to be kept for two years.

Laboratory opening hours and access authorization are managed by the laboratory supervisor. Anyone who breaches or infringes the General Laboratory Safety Rules may be prohibited from using the laboratory.

3. Hazards

There are numerous hazards associated with handling technical equipment and with using physical, chemical and biological methods. Persons carrying out such activities may suffer acute or chronic health effects, such as injury, burns, irritation, corrosive injuries, poisoning, frostbite, allergies and chromosomal damage.

The release of hazardous substances into the air, water or soil may cause environmental damage.

4. Safety measures

4.1 General information

- Anyone working in a laboratory shall work in a manner that does not harm or endanger others. **Hazardous work may only be carried out if there is at least one other person within calling distance.** All persons present in the laboratory must be notified about the hazards and the necessary safety precautions.
- All safety equipment (e.g. emergency shutdown systems) must be readily accessible at all times and must never be deactivated. Defects and damage to safety equipment shall be repaired by lab personnel, provided that they have the necessary competence to do so. In all other cases, the fault must be reported immediately to the lab supervisor.
- If an experiment requires continuous monitoring, the person conducting the experiment may only leave the workspace if another suitably briefed person assumes monitoring duties, or if appropriate automatic protective equipment is in place that reliably prevents hazardous situations from occurring.
- Hazards, such as water spillages or oil films on floors, must be eliminated immediately.
- Walkways and corridors, particularly escape and rescue routes, must be kept unobstructed across the prescribed minimum clear width. Openings, doors and windows must be unobstructed and accessible at all times. Fire doors and smoke control doors must be kept closed at all times, unless fitted with an approved door retainer.
- Anyone working in a laboratory must know where the emergency shutoff devices for the gas, electricity and water supplies are located and how they operate. If an emergency shutoff device is actuated, the laboratory supervisor or person in charge at that time must be notified.
- Whenever a fire extinguisher is deployed, it must be sent for servicing after use. If sand is used to extinguish a fire or an absorbent binder is used to mop up spillages, the buckets/containers must be refilled after use.
- Anyone working in a laboratory must be acquainted with the emergency equipment in that area, particularly the locations of emergency showers and eye-wash stations, fire-fighting equipment, first-aid cabinets and the escape and rescue routes leading out of the building.

4.2 Protective clothing and personal protective equipment

- Protective clothing and/or personal protective equipment (such as safety glasses, gloves, respirators) that is provided must be used.
- For certain workplace hazards appropriate work clothes must be worn, e.g. a cotton apron, non-slip, closed-toe shoes. In such cases, normal street clothing is not suitable for laboratory work.
- The laboratory supervisor shall ensure that the emergency body showers and eye-wash stations are subject to functional testing at least once a month by a person appointed by him.
- Lab personnel shall verify the proper functioning of safety cabinets on a monthly basis.
- The contents of the first-aid cabinets shall be regularly checked for completeness, any missing materials restocked and any sterile medical dressings replaced if these have passed their expiry date.

4.3 Electrical equipment, machines, test rigs

- Electrical equipment and machines in laboratories may only be used for their intended purposes.
- Electrical equipment and systems must be in good working order and must conform with generally accepted technical rules, in particular the relevant VDE regulations (VDE: *Verband der Elektrotechnik Elektronik Informationstechnik e.V.* / Association for Electrical, Electronic & Information Technologies). Settings on safety devices may not be altered or deactivated. In the event of damage or unusual behavior, the equipment or systems must be switched off and checked by a qualified electrical technician. Defective equipment or systems must be taken out of service, tagged and locked out to prevent use by others. Portable electrical equipment must be checked at intervals specified in the DGUV-V A3 test specifications.
- Persons working with strong magnetic fields must be aware of the associated potential hazards.
- Any apparatus or equipment that runs overnight must be fitted with the requisite safety systems (e.g. liquid level controller, water detector). Long-term experiments must be labeled and operated in such a manner that, according to expert technical opinion, the experiment does not pose a hazard outside of normal laboratory working hours. If necessary, the person responsible for the experiment must be contactable by phone and must leave their telephone number on the outside of the laboratory door.
- Before first use, any potentially hazardous experimental setup must be subjected to a safety check by the laboratory supervisor or by someone authorized by the supervisor. The laboratory supervisor may be required to conduct a risk assessment in accordance with Sections 5 and 6 of the German Labor Protection Act (*Arbeitsschutzgesetz*).

4.4 Working with radiation

- Any work involving x-rays, optical radiation (UV, laser and infrared radiation), microwaves and ionizing radiation may only be carried out in accordance with statutory regulations and, where applicable, after the necessary licenses for working with radioactive substances and the necessary notification have been issued. The relevant safety regulations must be observed.
- Laser systems in the safety classes 3R, 3B and 4 must be registered with the university authorities before first use and when taken out of service. The requisite notification is to be provided via the laser safety officer.

4.5 Working with gas cylinders, pressure and vacuum equipment

- Pressure vessels must be transported using the appropriate cylinder cart and must be properly secured during transport (cylinder safety cap must be screwed on, cylinder must be chained to cart).
- To prevent them from falling, pressure vessels must be secured to a wall or other rigid structure using the available chains.
- Pressure vessels must not be stored in laboratories. The only pressure vessels permitted in the lab workplace are those required to ensure the uninterrupted progress of the work being carried out. Laboratories in which compressed gas cylinders are in use must display the “Pressurized Cylinders” warning sign. Gas may only be withdrawn from a compressed gas cylinder if the cylinder valve and pressure regulator and the piping, hosing or tubing used are suitable for the type of gas and for the pressures involved. It is very important that oxygen does not come into contact with greases or oils, and that acetylene is kept away from copper or lead.
- Any person working with glass apparatus that is under vacuum must at least wear full-frame safety glasses with side shields. Large pieces of glass equipment that are operated under vacuum, particularly lab dessicators must be positioned behind a shatterproof shield (e.g. a narrow-mesh wire jacket or a safety screen).
- When pumping off gases, solvents vapors, etc. the pump’s outlet port must discharge via a secure hose line or tubing to a fume hood or to atmosphere.
- Glass vessels that will be evacuated or will be used as part of a vacuum apparatus must be stress- and crack-free and have wall of sufficient thickness.
- Glass vessels with level surfaces, such as vacuum flasks and dessicators, may only be evacuated if their walls are sufficiently thick and the vessel has been specifically approved for use under vacuum. Vessels of this type must never be heated.
- Information on the testing of pressure vessels and pressure equipment is set out in the Pressure Equipment Directive (http://www.druckgeraete-online.de/seiten/dgr_1.htm).

4.6 Working with chemicals and hazardous substances

- In areas where work with hazardous substances is carried out, an inventory must be compiled in accordance with the specifications in the German Ordinance on Hazardous Substances (*GefStoffV*) that contains the classifications and quantities handled for each hazardous substance. The inventory may be stored in printed or electronic format, must be reviewed at least every six months or whenever significant changes occur and must be presented to the competent authorities on request.
- Before any work involving hazardous substances is carried out, the person using the laboratory must conduct a risk assessment based on the annexes to the German Ordinance on Hazardous Substances or on information in the manufacturers' or vendors' catalogs. Manufacturers of hazardous substances are required to provide material safety datasheets.
  The R-phrases, which provide detailed information on the specific hazards associated with a hazardous substance, are considered to be part of the standard operating procedure involving that substance. Effective June 1, 2015, hazard and safety information will only be provided in the form of H-phrases and P-phrases and by the GHS hazard pictograms.
- Hazardous substances must not be kept or stored in any containers that could be mistaken for food containers.
- All bottles and jars containing hazardous substances must be labeled with the name of the substance and the hazard pictogram. Large containers must be labeled in full, i.e. with R-phrases / H- and P-phrases.
- Toxic materials must be kept in secure storage by an authorized competent person (outside the lab workplace or in a safety cabinet).
- Any flammable liquid kept at a lab workspace for ordinary manual operations shall be stored in containers with a nominal volume not exceeding 1 liter and the total quantity of the flammable liquid shall not exceed the amount required for use during one working day. Excess quantities must be stored in a secure space (e.g. a storage cabinet). Safety cabinets shall be tested once a year by a maintenance company.
- Flammable liquids that need to be stored in a cool environment and highly or extremely flammable materials must only be stored in refrigerators or freezers with explosion-proof interiors (absence of ignition sources).
- Persons working in laboratories should avoid breathing in vapors and dust and should not allow hazardous substances to come into contact with skin or eyes. If there is a risk of exposure when handling gaseous or powdery hazardous substances or hazardous materials with a high vapor pressure, such work must be performed in a fume hood.

4.7 Carrying out experiments

- Any person using a laboratory must receive a safety briefing and/or must have an understanding of the risks involved and the appropriate safety precautions to be taken based on the relevant experimental instructions, risk assessments, operating instructions and standard operating procedures. Occupational health and safety regulations must be observed.
- Competent persons are required to identify risks themselves, to assess these risks and to implement suitable control measures. This applies particularly when work is assigned or delegated to others.
- Any person using a laboratory must receive an initial oral workplace-specific briefing on the basis of the relevant standard operating procedure before they start to use the lab facilities and at least once a year thereafter. Proof of all instructions must be provided by the laboratory supervisor and the person(s) to be instructed.

4.8 Waste disposal

- The amount of waste should be minimized by only using those quantities of materials that are essential for the experiments being performed. Reactive residues, such as alkali metals, peroxides or hydrides, must be safely converted to other less hazardous substances.
- Any residual materials that cannot be reused and that are classified as special waste must be disposed of in accordance with the German Waste Management Act (KrWG).

4.9 Hygiene

- Reasonable rules of hygiene shall apply in the laboratories. Workspaces shall be kept free from contamination and cleaned regularly.
- No foods, drinks or tobacco products may be stored or consumed in laboratories in which hazardous materials are used. The application of cosmetics is prohibited inside the laboratories. The university management provides social and recreational rooms for such purposes.

5. Responding to hazardous situations and accidents

- **Keep calm and don't panic! Assess the situation and take action accordingly.**
- If necessary, call 112 to notify the fire service / emergency services control center.
- Warn anyone who might be in danger. If necessary, instruct them to evacuate their rooms. Remove injured persons from hazard area, but do not endanger yourself in the process! Provide first-aid treatment.
- If safe to do so, switch off any apparatus or equipment that might be affected by the incident. Switch off gas, electricity and water supplies, but do NOT switch off any cooling water lines. Leave the lights on in the laboratories. Notify your supervisor.
- You must seek medical attention from a doctor if an accident involved exposure to hazardous materials that could have long-term health consequences, or if you began to feel unwell or developed a skin reaction after exposure, or if you experienced an electric shock or were exposed to high-energy radiation. In such cases, you must notify your supervisor immediately.
- All accidents/assistance in the case of an accident (including minor injuries) must be reported and documented in a first-aid logbook. The accident reporting form must then be forwarded to the personnel department for archiving.
- The accident reporting form (https://www.uks.de/sidebar/unfallanzeigen) must be completed for any accident that resulted in a visit to a doctor's office (even if this did not lead to you being registered temporarily unable to work).

6. First aid

- Do not endanger yourself when administering first aid. Call the emergency numbers **112** as soon as possible.
- Move any person in the hazard area to fresh air.
- Remove any contaminated clothing (all if necessary) and place person under an emergency shower.
- If an eye has been contaminated, flush both eyes using a soft, upward-directed jet, preferably from an eye wash station that is connected to the drinking water supply. While holding the eyelids apart, move the jet of water from the outside of the eye toward the root of the nose, continue flushing for at least ten minutes.
- If someone has suffered acute cardiac arrest, automatic external defibrillators (AED) are available at the following locations:
  Campus Alt-Saarbrücken (CAS):
  - Building 4: First-aid room 4101
  - Building 8: Staircase: 1st floor
  - Building 10: First-aid room next to 10.01.17

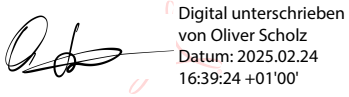
  Hochschul-Technologie-Zentrum (HTZ, InnovationsCampus in Burbach):
  - Room 6b
- Stop any bleeding and apply dressings and bandages. Put on disposable gloves before treating wounds.

7. Effective date

According to the resolution of the Faculty Committee from April 24th, 2019, these General Laboratory Safety Rules shall enter into force with the approval of the Staff Council on the day following their posting on the "Der Präsident" notice boards. At the same time, the previous General Laboratory Safety Rules shall cease to apply. The Laboratory Safety Rules will be laid out in all laboratory rooms belonging to the Faculty of Engineering.

Saarbrücken, February 19th, 2025

The Dean



Prof. Dr.-Ing. Oliver Scholz

Appendix 1: Important telephone numbers, authorized personnel and first aiders, laboratory list

Emergency Call	112
On-call service CAS	732
Late Shift CAS	see notice room 4102 and intranet respectively
Facility Management	see intranet
Central mailroom or gateCAS	600 or 124
Poison Control Center – Uniklinik Homburg	06841/19240
Specialized Contact for Occupational Health and Safety: Thomas Bischoff	99050
Occupational Medical Officer: Dr. med. Steffen Kerner (AMZ)	06897 / 50594 - 0
Radiation Safety Officers: Sabine Jung	 231
Laser Safety Officer: Prof. Löffler-Mang	 247

Qualified first aiders at the School of Engineering:

https://www.htwsaar.de/htw/brandschutz-erste-hilfe/

Laboratory list:

https://www.htwsaar.de/ingwi/labore
https://www.htwsaar.de/ingwi/labore/laborordnung/ingwi_laborliste.pdf