

SDE labs GUIDE

Welcome to the SDE labs!

Lab regulations

- It's everybody's personal responsibility to work safely in the SDE labs
- The SDE labs are primarily meant for research
- Lab access is only given to users after training and the completion of required quizzes
- Lab access is granted on a personal basis; don't let others into the lab or lend out your card
- Machines and equipment may only be used after training from the technical staff

Table of contents

Lab regulations	1
Introduction.....	3
Safety.....	5
Labs	7
Working in the lab	14
Reservations and booking	15
Appendix A, Risk categories	16

Introduction

Welcome to the SDE labs. The SDE labs are a collection of labs and workplaces oriented towards research within the IDE department. Look at the page with the floor plan for a quick overview of the labs. The SDE labs are available for researchers (PhD-candidates, postdocs, etc.) and graduation students. There is very limited room to use the SDE labs for educational purposes. Space can be assigned for prototype building, and there are several workplaces available. For graduation students, there must be a staff project owner (academic or support staff).

The SDE labs are run by the members of the technical support team consisting of Adrie Kooijman, Mascha Slingerland, Joris van Dam, Martin Verwaal, Joren Wierenga, Linda Plaude, and Luc Zeegers.

Contact

The technical staff can be contacted through their personal work email address or through the general lab email address: delabs-io@tudelft.nl

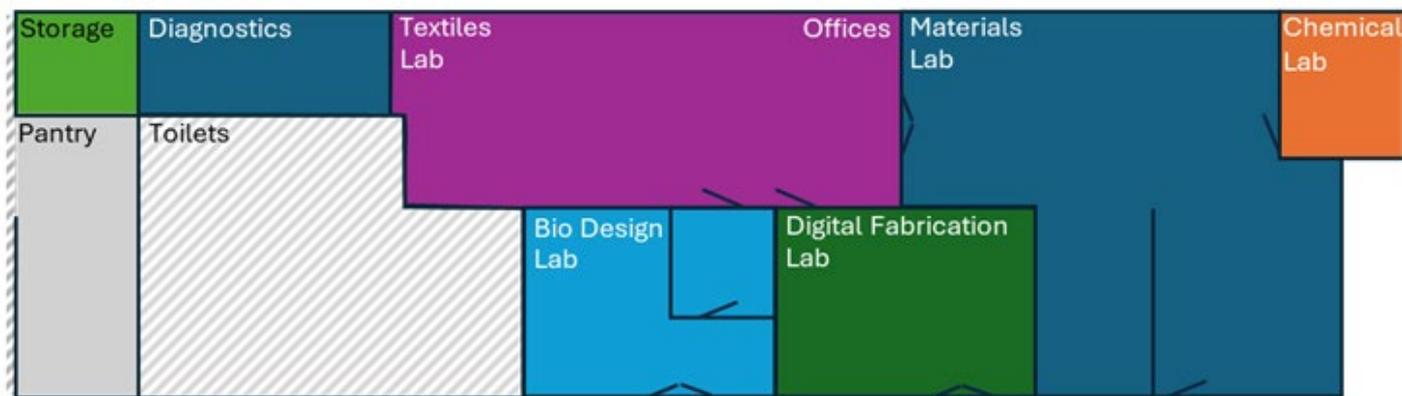
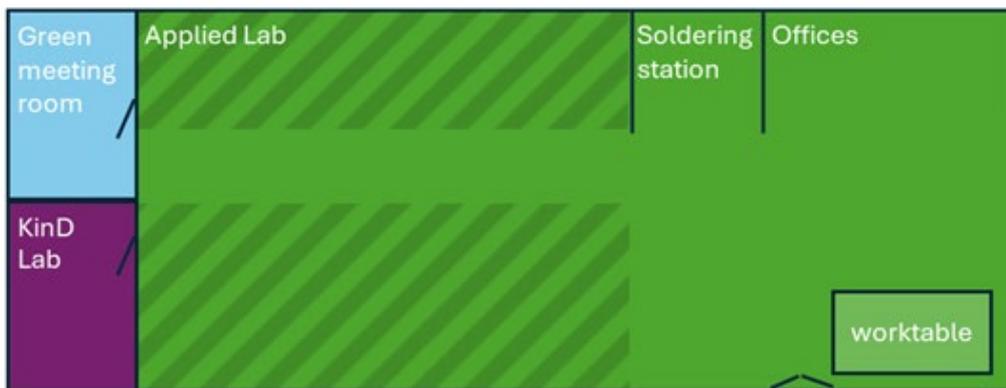
Access

Each lab within the SDE labs needs separate access, and access is given based on the needs of the project or research. To gain access, plan a meeting with somebody from the support staff to discuss the project, or type of research (preferably with the area supervisor of the required lab). After this a form needs to be completed. Based on which labs are required, quizzes need to be completed. An introduction to the lab will be given by the responsible area supervisor for each lab. Once all access requirements are met, access will be granted on the campus card for the project's duration. Machines may only be used after instructions. If you have not received instructions for a machine, you are not allowed to use it. Even if the machine is in a lab that you have access to.

Area supervisors

Lab	Area supervisor	Deputy area supervisor
Applied lab	Martin Verwaal	Adrie Kooijman
Biodesign lab	Joren Wierenga	Mascha Slingerland
Chemical lab	Mascha Slingerland	Joren Wierenga
DiFa lab	Joris van Dam	Joren Wierenga
Materials lab	Mascha Slingerland	Martin Verwaal
Textile Lab	Linda Plaude	

Floorplan SDE labs



	Materials Lab	For working on new materials or new applications of materials; Knitting machine, loom, heated press, climate chamber, drill , and more
	Chemical Lab	For working with chemicals in a protected environment; Storage of hazardous chemicals
	DiFa Lab	Digital Fabrication Lab, 3D printing with various materials; Advanced 3D printing with the Connex; Laser cutting
	Textiles Lab	For working with fabrics and smart textiles; Sewing and embroidery machines
	Bio Design Lab	For working with micro-organisms; ML-1 safety regulations apply
	Diagnostics	Tensile/compression testing; Rheometer, Q800, Zwick
	KinD Lab	Lab space for the KinD group; User-tests
	Applied Lab	Lab space with offices, and flexible space for projects (research, graduation); Soldering station
	Green Room	Meeting room; can be reserved with outlook

Safety

Behavior

Always work safe. Use tools and equipment responsibly. Always return tools and equipment to their place after use. If you break something, inform the technical staff! Tools and equipment are to be used inside the labs. If you want to take anything out, consult the technical staff first!

Keep your workspace clean and dispose of all waste responsibly. Discuss with Mascha or Joren for disposal of chemicals. Eating in the lab, especially near lab-equipment or chemicals is strongly discouraged; in the Chemical lab, the Materials lab, the BioDesign lab, the DiFa lab and the Diagnostics lab eating and drinking is prohibited. Keep coffee and other fluids far from vulnerable equipment. A lunchbreak away from your workplace is a healthy habit.

Respect the set-ups of other lab users. Do not touch anything or (re)move their devices without consulting the owner or the technical staff.

Emergencies

Safety first. Think about your own safety and that of your co-workers. Notify the technical staff, the Servicepunt and the emergency services as required. Always be aware where the (emergency) exits are. Follow the faculty safety rules – know them. Internal (TU Delft) emergency number is 015 278 8888, national emergency number is 112

Prototype safety

Prototypes must be safe (eg: NEN/ISO standards). Mechanically and electrically. For advice and information consult the members of the technical staff. If your prototype must be connected to a 230V outlet, please consult a technical staff member. The set-up must be checked by a technical staff member before it is plugged in.

For small accidents there is a First Aid Kit (EHBO) at the desk of the Technical Support Team and in the Materials lab (including materials for burns). First Aid is available at the Service Point IO and the PMB. In case of Emergency call 015 278 8888 or 112.

Risk categories

Machines, equipment and working procedures all come with their own specific risks. These have been divided into three risk categories: low, medium, and high. Depending on this categorization, working with these can be done alone, or needs another person present. This also depends on the time of day; during office hours there are generally more people around and thus incidents will be spotted quickly. Additionally, during office hours emergency response personnel (BHV in Dutch) are present to provide help in case of an accident. Outside office hours there are less people around, and there is no guarantee of emergency response personnel present. Because of this, working on medium-risk machines requires the presence of an extra person who is aware of the situation. This second person must be someone who has access to the lab but does not necessarily have to be trained for the machine that is operated. Working with high-risk machines is prohibited outside office hours. See table on the next page.

	Low risk	Medium risk	High risk
During office hours (8:00 - 17:00)	Working alone is permitted	Working alone is permitted	A second person must be present
Outside office hours (17:00 - 08:00)	Working alone is permitted	A second person must be present	Work is prohibited

See: “appendix A, risk categories” at the bottom of this document for more information on risk categories of machines, equipment and working procedures.

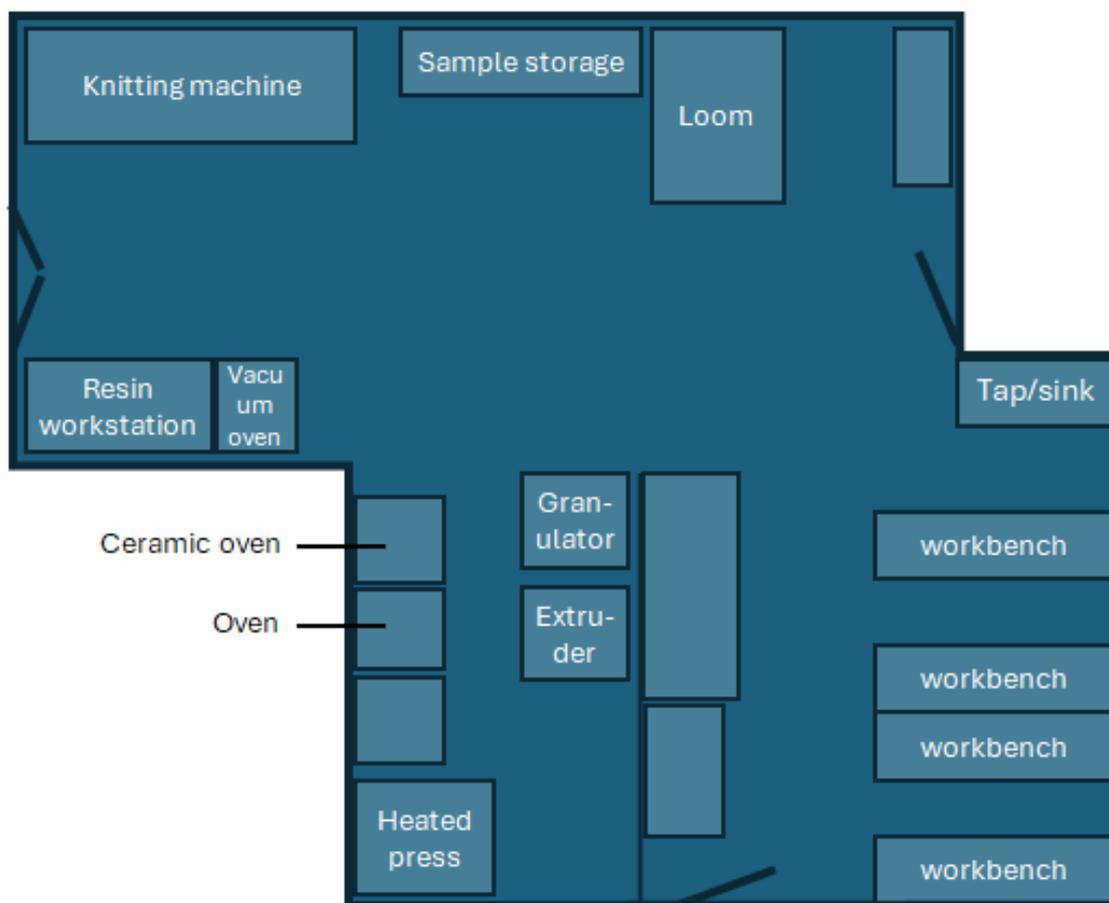
Labs

Materials lab

The materials lab is to work on new materials or applications of new materials. Furthermore, it's the place in the lab where most of the large equipment is located. There are several benches in the materials lab for working and prototyping. However, it is not meant for office work.

In the materials lab there is some heavy machinery and possible hot surfaces. Safety instructions from the area supervisor are needed before getting access.

Materials Lab



Wear closed shoes



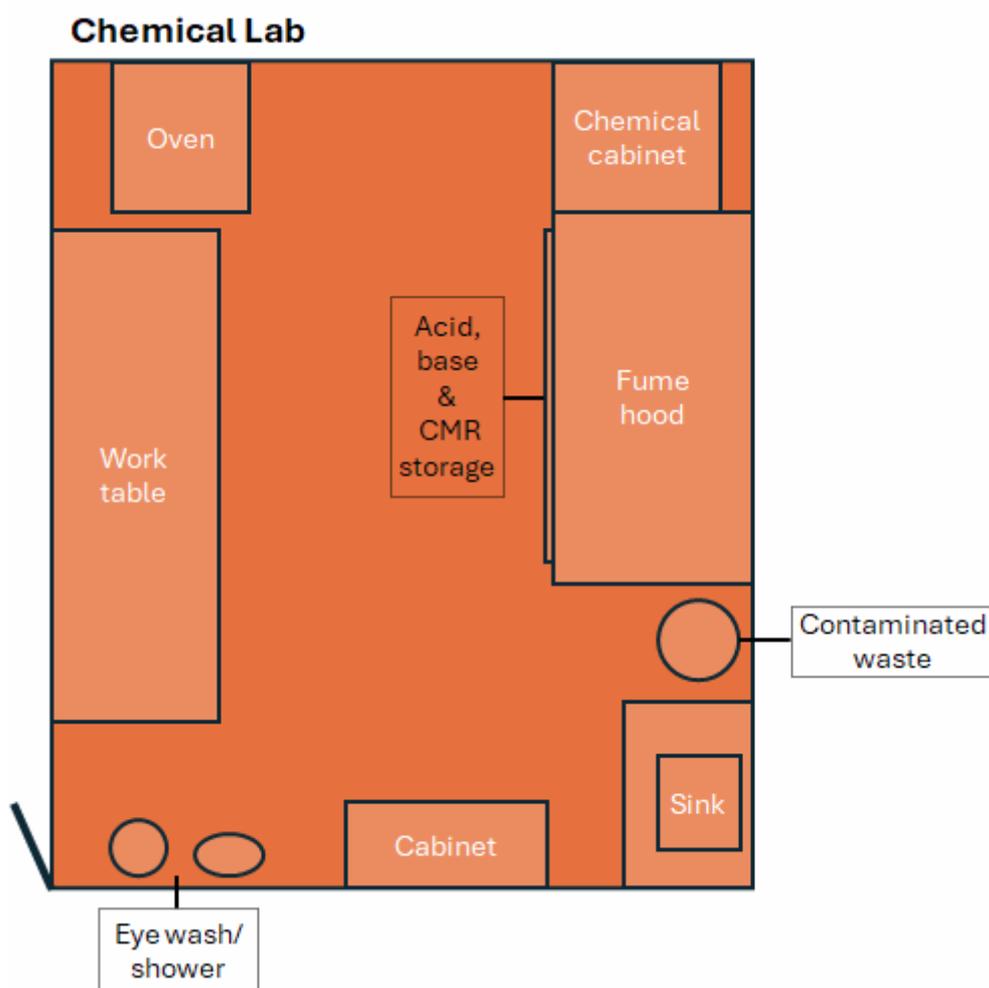
No bags or coats



No eating or drinking

Chemical Lab

The Chemical Lab must be used when handling flammable, volatile or poisonous substances. Appropriate protective clothing is obligatory when entering this lab space. The lab is equipped with a fume hood that vents potential harmful gases, and a chemical storage cabinet where dangerous substances are stored safely. The lab can only be used after instruction by the area supervisors. For each new experiment a Risk Assessment needs to be made.



Wear a lab coat

Wear gloves



Wash hands

leaving/entering



No eating or

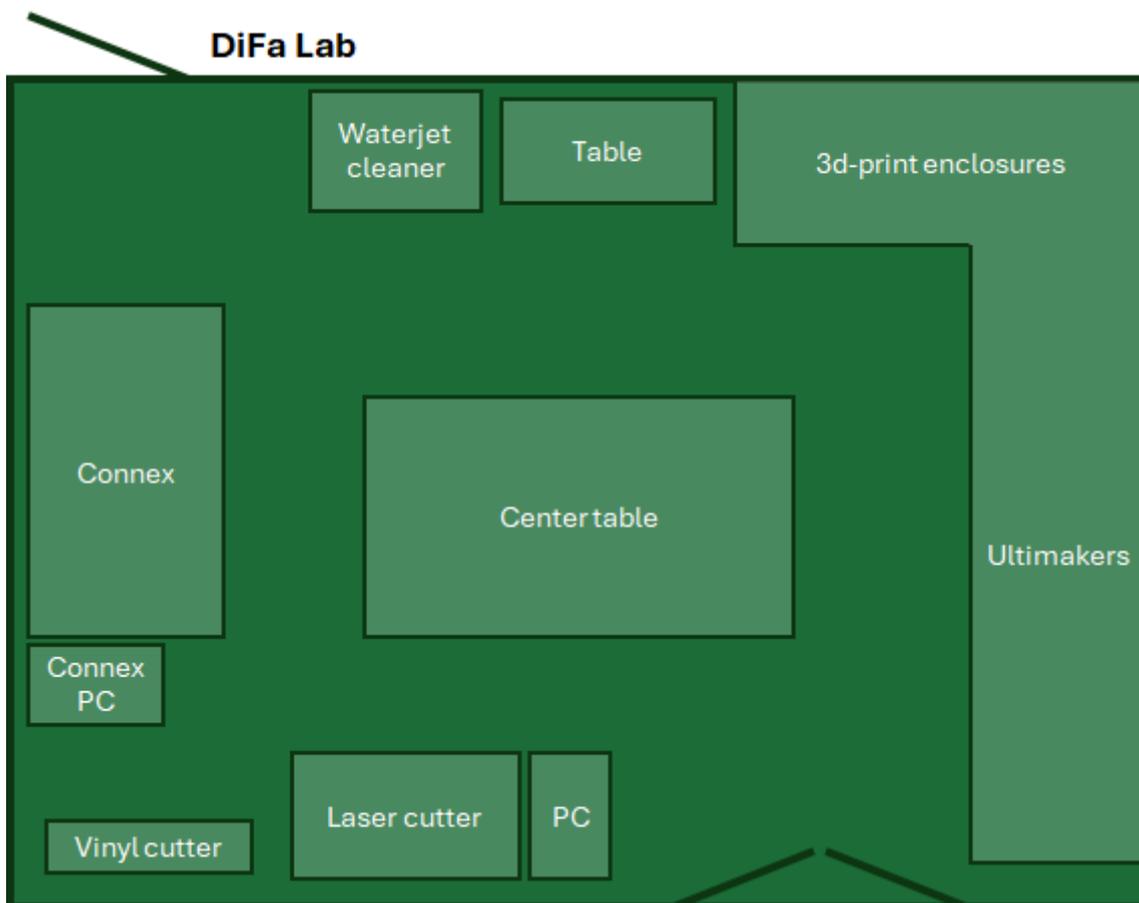
drinking

DiFa Lab

The Digital Fabrication lab is equipped with FDM 3dprinters (Ultimakers), a lasercutter and a vinylcutter. These are available to SDE lab residents only and after instruction. To use, reservation of this equipment is required (see attachment B).

Additionally, a high resolution multimaterial/multicolour Polyjet 3dprinter is available (Connex J735). Material costs apply, and are ~1 euro per cm³.

For access to the Digital Fabrication lab or other questions, email Joris van Dam at j.v.dam@delabs-io@tudelft.nl.



Wear closed shoes

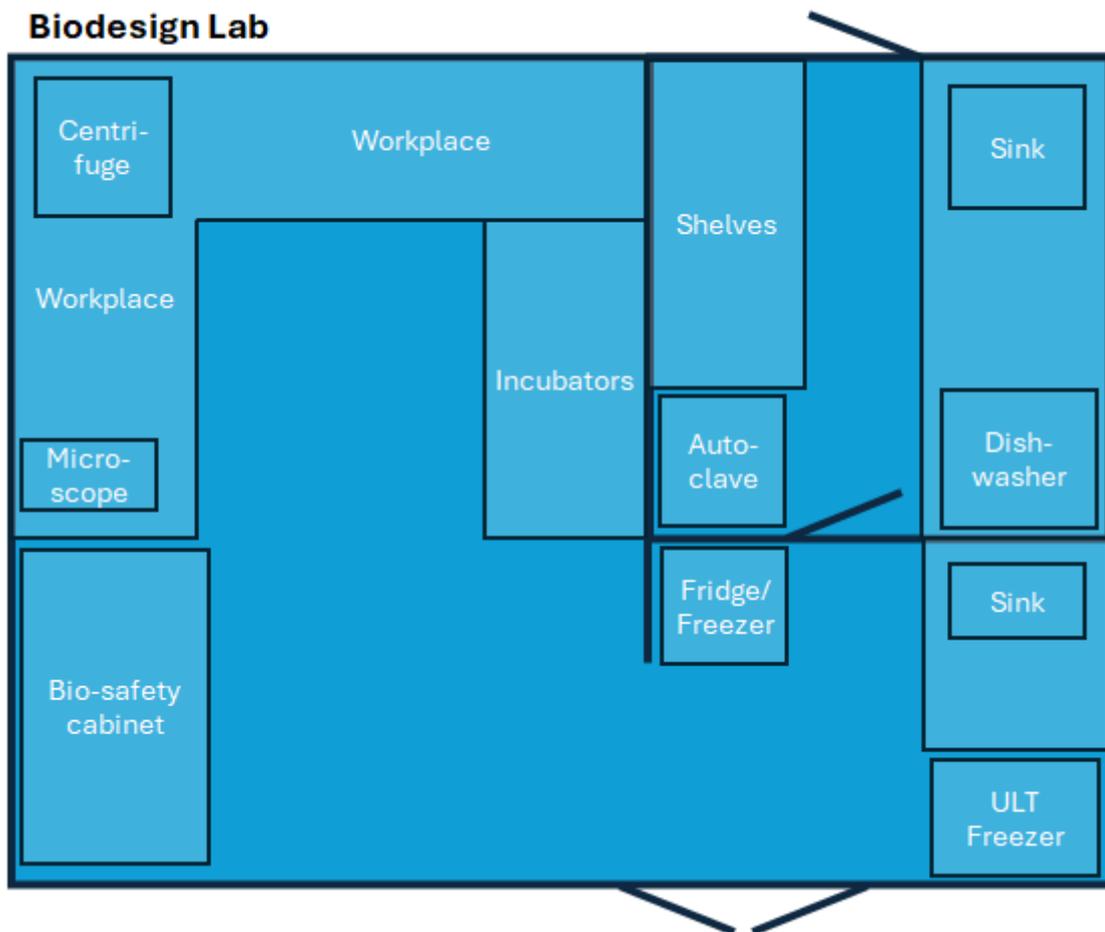


Wear protective gloves



No eating or drinking

Biodesign Lab The BioDesign lab is an ML-1 microbiology lab where micro-organisms can be handled and grown safely. It's equipped with a bio-safety cabinet that protects both the user and the micro-organisms. There are incubators to set the specific growth requirements for different species and types of micro-organisms. Other equipment includes an autoclave for sterilization purposes, an ultra-low temperature freezer, a centrifuge, a dishwasher and more. There is also space to put custom made setups. Contact the area supervisor for more information and access.



Wear a lab coat



Wash hands leaving/entering



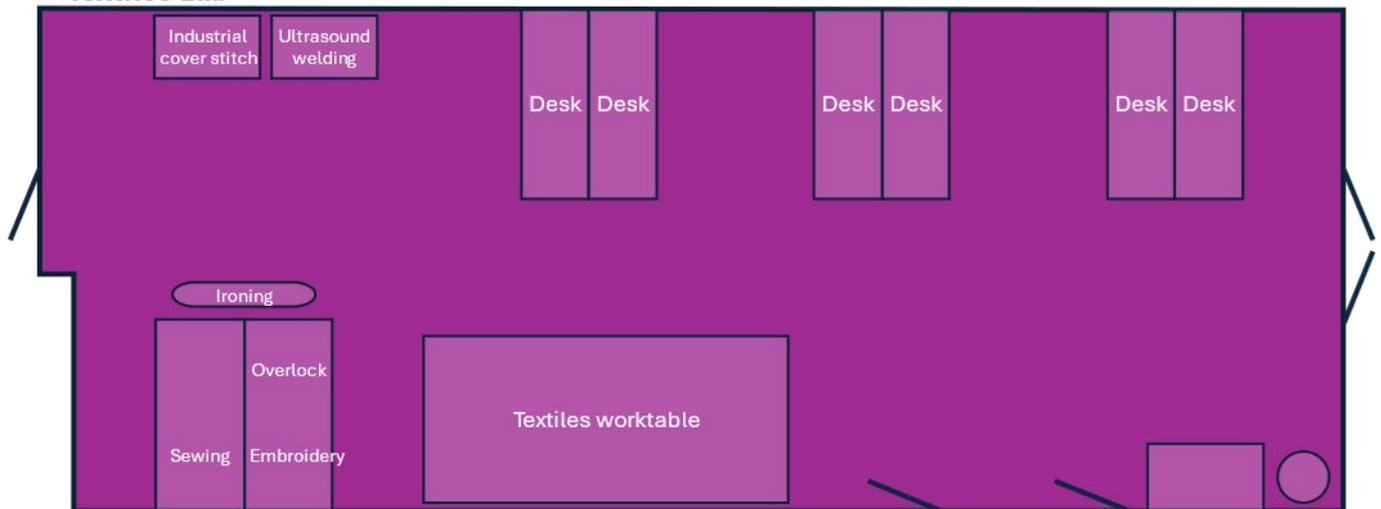
No eating or drinking

Textile Lab

The Textile lab is a place to work on assembling and manipulating existing textiles or to create whole new textiles. It is equipped with domestic and industrial sewing machines, that can handle thin stretchy and non-stretchy textiles. It is not suitable for working with thick/hard textiles and leather. Knitting and weaving techniques are used in the Textile lab for creating new textiles. For this purpose, there are small machines for some simple sampling. For more sophisticated textile creation, computerized larger machines and software are used. These are rather complex techniques and require serious training and assistance by specialists.

The textile lab is often used for prototyping with 'Electro-textiles'. These are textiles that contain electrically conductive threads or coatings, focussing on making electronics & sensors comfortable and wearable. You can also find textile heat-press, ultrasound welding machine and iron in this lab.

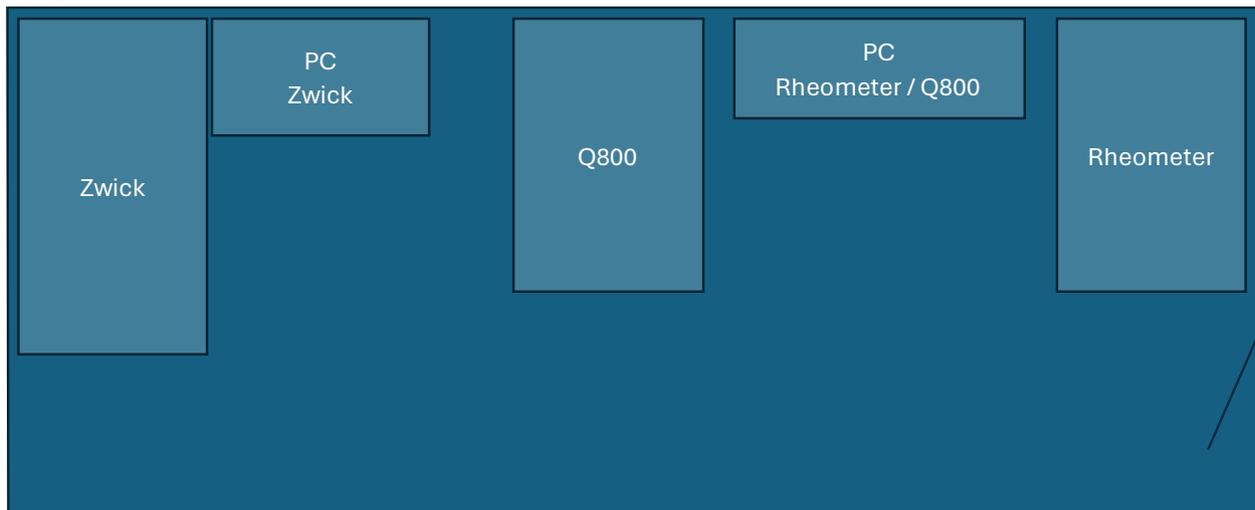
Textiles Lab



Diagnostics

The Diagnostics lab hosts some diagnostic machines where tensile, compression, bending and viscosity tests can be done. To make use of these machines, instructions from the area supervisor is required.

Diagnostics

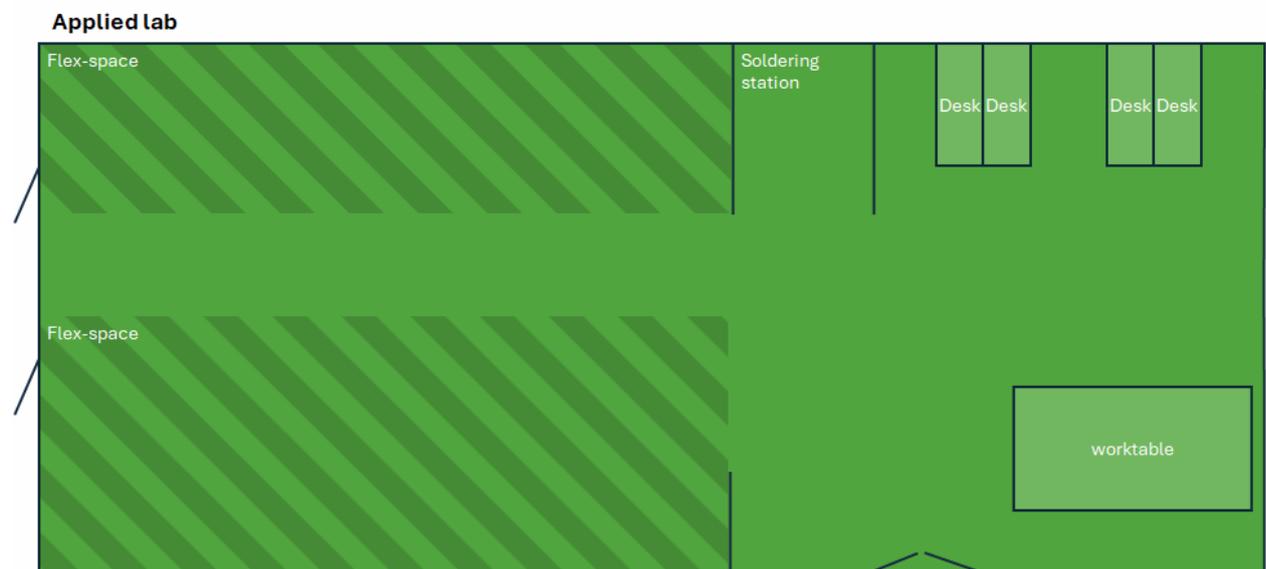


Applied Lab

The applied labs are a more general lab space with research setups of many kinds, like seat comfort research, scanner development, automotive research and health device development. It offers space for researchers as well as graduating students. There are several special provisions, like an advanced soldering station and a recording facility for product analysis and repair.

Use of this space is only for research setups, and eventually the researcher or graduation student conducting the research.

Part of the Applied Labs is the tech support desk, which has measurement devices, cameras, and some good advice for your projects available.



Working in the lab

Starting and finishing

To work in the lab, access must be granted (see the section on access for more info). An introduction will be given by the responsible area supervisor. Normal working hours in the lab are from 8:00 until 17:00. When a project is finished, clean the work area and discuss with the technical staff about samples or other work that needs to be stored. Prototypes, materials, and other objects not properly labeled will be trashed.

Facilities

The use of furniture, workspaces, cabinets etc. is in consultation with the technical staff. Keep aisles free at all times. There is only limited storage space inside the lab. Ask the technical staff if you need locked space or external storage space for your prototype. Storage space in the basement is available, but for a limited time only. Always label your stuff with name, phone number and expiration date, stickers are available. Unidentifiable or unmarked objects may be disposed of without warning!

Equipment

Before using the equipment, you must get instructions on how to use this equipment. Especially for the Difalab, the Chemical lab, the Materials lab, the Chemical lab and the BioDesign lab you can only get access, after being instructed by a member of the technical staff. To reserve equipment, you should follow the procedure in the chapter “Reservations and booking” (page 15), only after approval of the reservation are you allowed to come to use the equipment. You can reserve maximum 1 week ahead.

Material

There is some stock material available for use, like tape, glue, and batteries. Please discuss with the technical staff before using these materials. If the materials are not available the technical staff can help you order it, please ask! Never use materials from other projects without explicit approval of the owner.

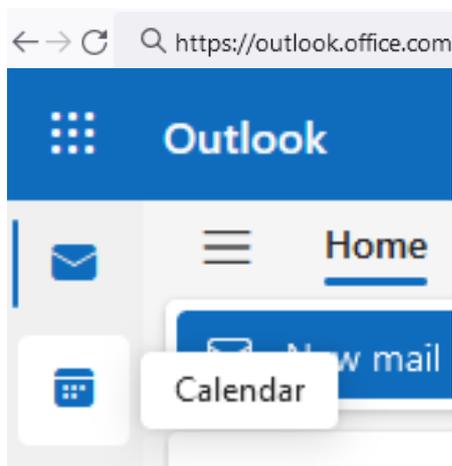
If you need larger quantities buy or bring them yourself, after discussing this with the technical staff. It's not allowed to bring your own chemicals into the lab. These must be bought by the technical staff through the labservant system. Please notify the technical staff if supplies are running low. Consult with the technical staff if you want to bring your own electronic equipment or prototype into the lab.

Reservations and booking

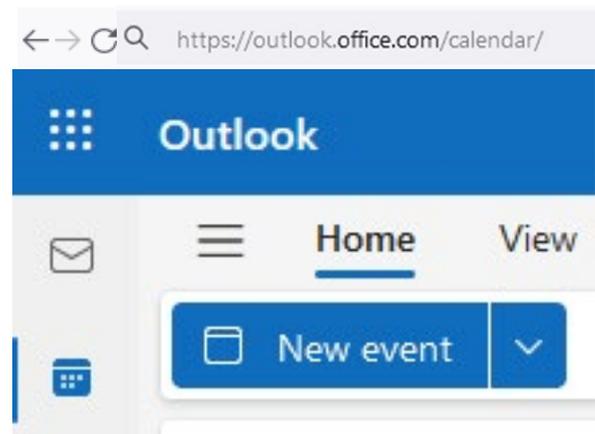
To make reservations or book equipment we use the outlook calendar. To make a booking or reservation, make an appointment with the name of the equipment or room in the subject. Add the delabs-io@tudelft.com as a (required) attendee.

When a reservation or booking has been made, someone of the technical staff will either accept or decline it. The reservation/booking is only confirmed after it has been accepted.

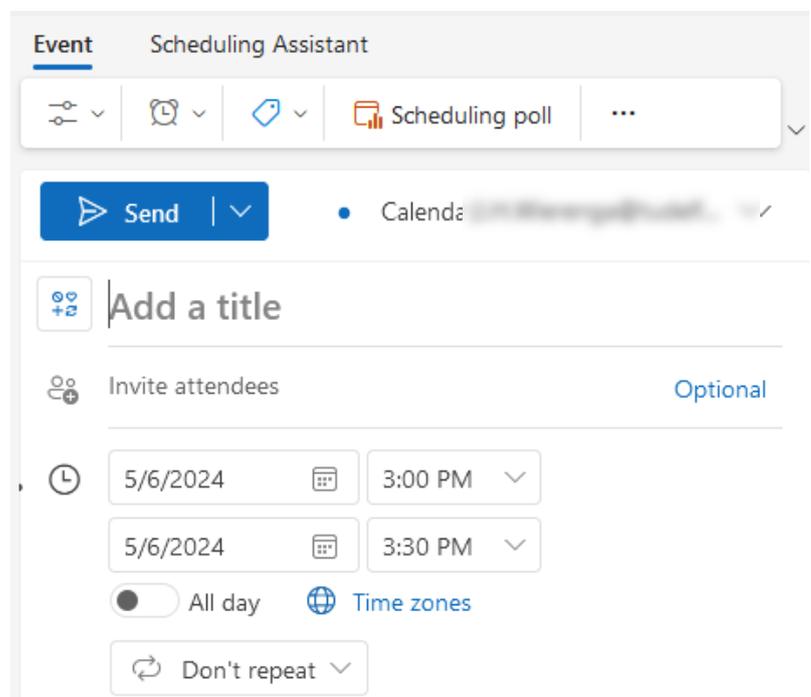
Go to: outlook.office.com, and switch to calendar



Click on “New event”



- Add a title with the name of the equipment or room
- Add as an attendee
- Specify the time and date
- Click “Send” to request the reservation/booking
- The reservation/booking will be accepted or declined by a member of the technical staff



Appendix A, Risk categories

Category 1: Low risk work

Activities posing no or a negligible risk. Interpreting data, taking readings from equipment or making adjustments via computers, as long as this does not lead to interventions in an experiment.

- Office work
- Measurements
- Augmented reality
- Home use equipment
- Work with biomaterials
- 3D printing
- Organic chemicals at room temperature (acetone, ethanol, isopropanol)

Category 2: Medium risk work

Activities posing a medium risk. Simple laboratory work, such as routine activities with low- risk chemicals in the fume cupboard, changing specimens, using a known procedure or test on a standard machine

- Soldering station
- Machines with mechanical risk following a known program
- Machines with risk for burns / severe skin burns following a known program
- High voltage (230V and more)
- Virtual reality
- Ladder
- Inorganic chemicals, except for the inorganic chemicals mentioned in category 3
- Organic chemicals on elevated temperatures

Category 3: High risk work

Activities posing a high risk, which could lead to serious danger. Examples include working with mechanical machines, working with hazardous or inflammable chemicals and gases, working with cryogenic liquids, changing specimens, work involving high pressure, adjusting experiment set-ups, and working with components involving live electricity.

- Lasers, unless otherwise stated in laser safety report
- Machines with mechanical risk setting up a new experiment/ program
- Machines with risk for burns / severe skin burns setting up a new experiment/ program
- Working with liquid nitrogen
- Inorganic materials that are poisonous, toxic, highly reactive, explosive, corrosive, oxidizing and/or CMR *see table 1⁷