LABORATORY REGULATIONS

1. Aims

These Laboratory Regulations are intended to ensure safe working practices, environmental protection and operating efficiency with regard to laboratory use.
Essentially these targets are to be achieved by responsible, competent and correct use of the buildings, installations, machinery and equipment, as well as an economical use of energy, water and other media. They should help

- to safeguard the health and physical safety of laboratory users,
- to keep damage to a minimum in the case of accidents
- and to avoid environmental pollution.

2. Scope and legal fundamentals

The Laboratory Regulations are valid for all users of laboratories in the Natural Sciences. These regulations take into account Accident Prevention Regulations (Unfallverhütungsvorschriften UVV), in particular the UVV for Lasers (GUV-I 832), DGUV Information 213-850, Regulations for Hazardous Materials (GefStoffV), and other generally recognised rules with regard to technical safety, occupational medicine and hygiene, as well as other assured scientific working knowledge.

3. Responsibilities of laboratory users

Laboratory users must be aware of and adhere to these Laboratory Regulations. Each user must sign that he or she has read these Regulations.
In the case of serious violations of responsibilities, the user can be banned from the working area.

4. Dangers for people and the environment

The use of physical, chemical or biological methods including their technical applications contains a number of risks.
Acute or chronic damage to personal health may occur in the form of e.g. injuries, burns, frostbite, corrosive burns, poisoning, skin irritation, allergic reactions, infectious diseases, cancer, and hereditary or reproductive damage.
Release of hazardous substances into the air, water or ground can lead to environmental damage.

5. Protective measures

5.1 General

The Laboratory Guidelines (DGUV Information 213-850) which must be displayed in every laboratory give a detailed description of the correct behavioural procedures, and complement these regulations.
In a laboratory, one must work in such a way that no damage is caused to anyone, nor is anyone put at risk or interfered with more than the circumstances warrant. When dangerous work is being performed, at least one person must be within calling distance, and all persons in the vicinity must be informed about the dangers and the protective measures that are necessary.
The leader of the working group or practical class has control over the opening times and entrance requirements for his or her area.
In accordance with the Accident Protection Regulations (GUV-R A1 "General Regulations") laboratory users must be instructed in advance about possible dangers involved in their work as well as about measures for avoiding dangers, and subsequently at regular intervals of at least once per year.
Students and employees may only carry out work in accordance with the instructions given to them. Orders given by a practical class supervisor or scientific group leader have to be followed.
Smoking is prohibited in laboratories. Eating and drinking are not allowed in laboratories where poisonous, toxic or carcinogenic substances are deployed, as well as substances which affect fertility, and materials or agents which are infectious or suspected of being infectious. If in a specific laboratory area none of the above substances is being used, then the research group leader or practical class supervisor may designate areas in which the laboratory user may keep and consume food or drinks. Food or drinks must not be stored together with chemicals.
Sources of danger, in particular puddles of water or oil films on the floor, must be removed immediately. Escape and rescue routes must be kept free from any obstacles and sources of danger. Any faults in the building, equipment or installations which represent a safety risk must be reported to the group leader responsible or the Technical Headquarters ("Leitstelle", Tel: 22222).

5.2. Safety equipment and protective gear

Users must inform themselves about the various types of safety equipment, their usage and their location (e.g. fire alarms, hand-held fire extinguishers, fire blankets, first-aid cabinets, breathing masks, emergency showers and eye baths).
Accessories which are prescribed for the protection of the user must be used (e.g. lab coat, safety goggles, pipetting aids, desiccators safety covers, trolley for transporting gas cylinders). When carrying out work subject to a degree of risk the requisite safety gear must be worn.

5.3. Carrying out experiments

5.3.1 General

When carrying out experiments, laboratory users must inform themselves of the risks and the appropriate protective measures by consulting the experimental regulations, operating instructions and handbooks. Safety advice given in the instructions must be observed.
Special information sessions must be held in accordance with specific instructions, for instance, users must be instructed verbally about the Regulations for Hazardous Materials (GefstoffV) at least once per year in the place of operation and with reference to the operating instructions.
Those who work autonomously are responsible for ascertaining and assessing the risks and implementing suitable safety measures. This is particularly important if work is delegated to others.

5.3.2. Equipment

Equipment may only be used for the purpose for which is constructed. Faulty apparatus and defective electrical equipment may not be used.
Equipment which is left running overnight must have the requisite safety devices (e.g. level regulator, water safety cut-out). Long-term experiments must be labelled as such and carried out in such a way that in accordance with ones careful and informed discretion any danger is excluded even outside normal working hours. The person responsible should be contactable by phone if necessary and his telephone number should be displayed on the outside of the laboratory door.
The use of lasers, autoclaves, high pressure and vacuum equipment, centrifuges etc requires particular care and if necessary special instruction.
Any self-constructed experimental equipment must undergo a safety check before being put into operation.
When working in mechanical workshops equipment such as electric drills and grinders must be operated correctly. Instruction regarding the postgraduate workshops in the individual groups should be given by the technicians. The superintendent of the mechanical workshops is responsible for giving instruction with respect to the postgraduate workshop attached to the mechanical workshops.

5.3.3. Lasers

Laser beams pose a particular hazard, but so do electricity and the risk of implosion or explosion. Attention is drawn to the specific regulations governing the operation of laser equipment, in particular to "UVV Laser Radiation" (GUV).

5.3.4. Chemicals and hazardous substances

Chemicals stored in the laboratory must be organised, clearly arranged and restricted to the necessary amount; combustible liquids for small-scale use may only be stored in containers with a capacity of a maximum of one litre.
Larger quantities of combustible liquids have to be stored in cabinets and in rooms specially designated and labelled for this purpose.

Containers must be labelled with a clear indication of the substance and in the case of hazardous substances with the requisite hazard warnings and symbols. The storage of chemicals in commercial food containers or drinks bottles is forbidden. Substances that are poisonous, highly toxic, carcinogenic, alter the genetic make-up, or are detrimental to fertility should be accessible only to experts or informed persons.
If flammable substances are stored in fridges, then these fridges must be explosion-proof and labelled as such.
Chemicals which can give off gases or fumes which are hazardous to health must always be kept in a fume hood.
Suitable measures must be taken to avoid spillage when transporting and decanting chemicals. Spillages of liquid hazardous substances must be removed immediately in the proper manner. If necessary, any material used to absorb the substance must be disposed of as hazardous waste.
Chemicals available in the building, including any produced oneself, are to be used exclusively for research, teaching and training purposes. They must not be used for other purposes or removed from the building.
Combustible liquids may only be heated electrically using a return-flow cooler and a collecting trough and under constant surveillance.
Work involving the release of hazardous substances in the form of gas, steam, aerosol or dust must be carried out in a fume cabinet.
Skin contact with chemicals should be avoided. Protective gloves should be worn if required by the instructions pertaining to the substance.
Mechanical devices must be used when transferring liquids by pipette; mouth pipetting is strictly forbidden.

5.3.5 Pressurised gas cylinders and bottles

Pressurised gas cylinders may only be transported with the protective cap screwed shut and using special transportation trolleys. When in operation they must be secured so that they cannot tip over and be kept away from sources of heat. Pressure-reducing valves must be attached or exchanged only by an expert. Gas cylinders whose valves cannot be opened by hand must be appropriately labelled and removed from use.
Gas cylinders and bottles containing poisonous, highly toxic or carcinogenic gases, in so far as they have to be kept in the laboratory, must be stored so that any escaping gas is removed continuously, e.g. either by being kept in a fume chamber or special gas cylinder cabinet. The smallest possible amount of these gases should be kept for use at any one time.
Gas cylinders and bottles may only be kept in laboratories for the purpose of drawing off gas or immediately before a change of cylinder is to be carried out. Storage of cylinders in the laboratory is not permitted. Gas cylinders are not allowed to be kept in the corridor areas.

5.3.6 Cryogenic liquids

A series of dangers can arise with the use of liquid nitrogen or liquid helium if they are not handled correctly. The main sources of danger when handling cryogenic liquids are, as follows:-
- Spraying of cryogenic liquid > Risk of burns

Danger for the eyes
- Reduced oxygen level in the surrounding air due to evaporating nitrogen
Risk of suffocation
- Incorrect handling of cryogenic containers (i.e. storage vessels for liquid nitrogen, liquid helium and cryostats)
Risk of explosion
- Condensed oxygen from the air on very cold surfaces and the formation of peroxides on contact with organic substances
Risk of fire or explosion
Protective measures to be taken: wear protective gloves, wear goggles, provide good ventilation, do not leave container open and avoid contact with organic substances (including wood and paper).

5.3.7 X-rays / radioactive substances

When working with X-rays as well as radioactive substances and their storage, the rules contained in the relevant Approval Certificates ("Genehmigungsbescheid") must be adhered to.
As a rule such work may only be carried out in specially designated rooms.
The instructions of the respective Radiation Safety Officer, Mrs. Elke Brax, phone 22131 have to be followed.

5.3.8 Safeguarding against water damage

All equipment involving the use of cooling water must be connected to the internal cooling water supply and must be equipped with a water monitor, especially when operated automatically. The different water circuits (i.e. mains water and cooling water) must be kept separate.

5.4. Disposal of waste

A distinction must be made between normal and hazardous waste. Chemicals which are not designated as hazardous may be disposed of with the normal waste or waste water.
The correct disposal of hazardous waste is explained in the appropriate handbook. Highly reactive or toxic substances must be deactivated chemically before being disposed of in the special waste collection.
Hazardous waste must be collected in labelled special waste containers in accordance with instructions. Depositing waste in corridors, escape balconies or roof terraces is forbidden.
The user is obliged to arrange for the replacement of a full container (Phone22 137, Mr. Dick).
Separate instructions apply to the disposal of solid or liquid radioactive waste. These are defined in separate instructions pertaining to protection against radioactivity in accordance with each currently valid handling permit.

5.5. Hygiene

After completion of work the hands should be washed thoroughly before handling foodstuffs. Keeping or storing chemicals in common rooms is forbidden. Lab coats that have been used in laboratories must not be worn in other areas, such as libraries, lecture theatres, seminar rooms, dining halls (mensa) or cafeterias.

6. Action to be taken in the event of fire or accident

6.1 General

Rescuing from danger areas those who are injured or stranded takes priority over other measures. Despite the urgency, however, caution must be exercised.

A notice on the action to be taken in the event of a fire or an accident is displayed in every laboratory ("Brandschutzordnung und Alarmplan").

6.2 First Aid

First Aid must be administered immediately to injured persons.

If anyone is injured the doctor on emergency call must be informed. Phone: 112 or 0-116117

In the event of acute poisoning, advice can be obtained from the Central Office for the Treatment of Poisoning ("Giftnotrufzentrale"):

Giftnotrufzentrale Baden Württemberg 0-0761/ 19240

Giftnotrufzentrale Munich office: 0-089 / 19240

6.3 Fire

In the event of a fire endangered persons must be warned and, if possible without endangering oneself, rescued. If the fire cannot be extinguished with the equipment provided (hand-held fire extinguisher, fire blanket etc) without putting oneself at risk, the fire brigade must be called immediately using the nearest press-button fire alarm. If possible, further spreading of the fire should be prevented until the fire brigade arrives.

Those who are not involved in these measures should leave the danger area. Further information should be obtained from the Fire Regulations.

6.4 Accidents caused by hazardous substances

If uncontrolled amounts of gas, fumes, dust, solids or liquids of a substance which is injurious to health or the environment are released in a laboratory, all those present must be ordered to leave the danger area immediately. People in neighbouring areas must also be warned. The danger area must not be re-entered until the all-clear has been expressly given.

Every accident involving a hazardous substance must be reported to the following department:

Leitwarte: 22 222

Sicherheitsingenieurin: Mrs. Elke Brax, Dezernat V, Phone 22 131

Sicherheitsingenieur: Dr. Ulrich Ratschker, Dezernat V, Phone 22130

Gefahrstoffbeauftragter: PD Dr. Eckhard Kaufmann, Dezernat V, Phone 23886

If those who are affected on the spot are not able to ascertain whether it is necessary to call the fire brigade, the above-named offices will check the individual case and arrange for the

fire brigade to be summoned. If necessary the fire brigade should be called via the nearest press- button alarm.

7. Relevant Literature

Comprehensive literature on the topic of safety at work and an extensive collection of regulations governing safety and the law are available from the Safety Officers (Phone22 130, 22 131) Literature on the law relating to hazardous substances is obtainable from the university officer responsible for hazardous substances (Tel: 23886).
The Office for Environmental Protection and Waste Disposal (Mrs. Hay, Tel: 22 101) has relevant literature on this topic.

8. Validity

These Regulations must be displayed in every laboratory in the faculty.
Additions to these Regulations may be issued in individual areas of the institutes and research units of the faculty as the need arises.