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# Laser Safety (Class 4)

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## General Aspects of Safety in the Laboratory

It is not only your responsibility to “be safe”, but it is your responsibility to ensure those working around you “are safe too”.

Make sure you know and *understand* the procedures for the use and disposal of reagents, chemicals, cells and any potentially hazard materials.

If you are unsure of anything, ask a designated safety officer, first.

## Local Rules For The Safe Operation Of Lasers.

*Note: These rules are to be used in conjunction with the Laser User Guide and the Guide to the Artificial Optical Radiation Directive. Copies are available on the School Safety website*

### 1. SCOPE

These rules apply to all lasers, laser systems and laser users. This includes laser diodes (with output wavelengths between 200nm and 1mm) operating in this School and any other place where staff members operate lasers for research or teaching purposes.

### 2. AUTHORISED USERS

‘Authorised Users’ are those personnel who have registered with the School as a ‘Laser Operator’ and undergone the appropriate training

Registration includes:

- Completing the appropriate registration form (Available from Laser Technician)
- Reading and understanding the AURPO Laser Use Guide
- Viewing of Laser Safety Video

Training includes:

- Familiarisation with laser or light source operating procedures.
- The proper use of hazard control procedures. E.g. Warning signs etc.
- The need for personal protection
- Accident reporting procedures

**ANYONE not meeting the above criteria will not be allowed access to the laser facilities**

## Detailed Safety Procedures

3. Wear and ensure others in the room are wearing safety goggles appropriate to the laser wavelength and power. Class 4 lasers can damage tissue and skin and so opaque gloves (e.g. latex) must be worn and even so, hands (or fingers etc) should not be placed in the beam path as a method of locating the beam.
4. Ensure the laser warning sign and interlocks (where fitted) are active when the lasers are on.
5. Ensure all those present are aware of when lasers are on, and their light paths and possible reflecting surfaces.
6. Remove eyepieces from microscopes where direct or reflected laser light can pass through the objective. Use CCD or CCTV imaging to view substrates instead.
7. When designing new optical set-ups ensure laser light cannot leave the optical table or breadboard, or be directed towards the door.
8. When designing new optical set-ups avoid having beams that are angle upwards, towards eyelevel.
9. When using IR lasers, have an IR viewer or card available to locate beams.
10. Be aware of electrical safety surrounding the high voltages found on many laser tubes.
11. When appropriate, ensure laser chillers are on, and functioning efficiently. Keep water away from electrical connections.
12. LABELLING - See booklet entitled 'Radiation of Laser Products'
13. LASER FIBRE OPTIC TRANSMISSION SYSTEMS  
Laser products that employ fibre optic transmission shall have cable connections that require a tool for disconnection if the AEL for Class I is exceeded when disconnected and if such cable connections form part of the protective housing. Consideration should also be given to incorporating mechanical beam attenuators at connectors if servicing is anticipated in an unsupervised area. A length of fibre optic cable may sufficiently attenuate the transmitted laser radiant power such that the length of cable itself forms part of the protective housing.

### 14. ADMINISTRATION ARRANGEMENTS

The responsibility for the laser safety with the University lies with the Radiation Hazards Committee. Mr J.Gray of the Radiation Protection Service has the remit to ensure safe working conditions for all persons working with lasers in research and teaching. The School of Engineering has designated the three people listed below as School Laser Safety Advisors. These people will make periodic inspections of all laser installations within the School and may request improvement or modification to be carried out on equipment or rooms. It is laser user's responsibility to John Nelson or Zack Manson of all new laser operators and equipment in order that a register may be kept.

Emergency contacts:

UNIVERSITY LASER SAFETY OFFICER

James Gray

SCHOOL LASER SAFETY ADVISORS

Tony Kelly, Marc Sorel, Graham Green

SCHOOL SAFETY COORDINATOR Cyril Pacot

(e-mail addresses first.name.surname@gla.ac.uk, or university switchboard (ext 100) for current phone numbers