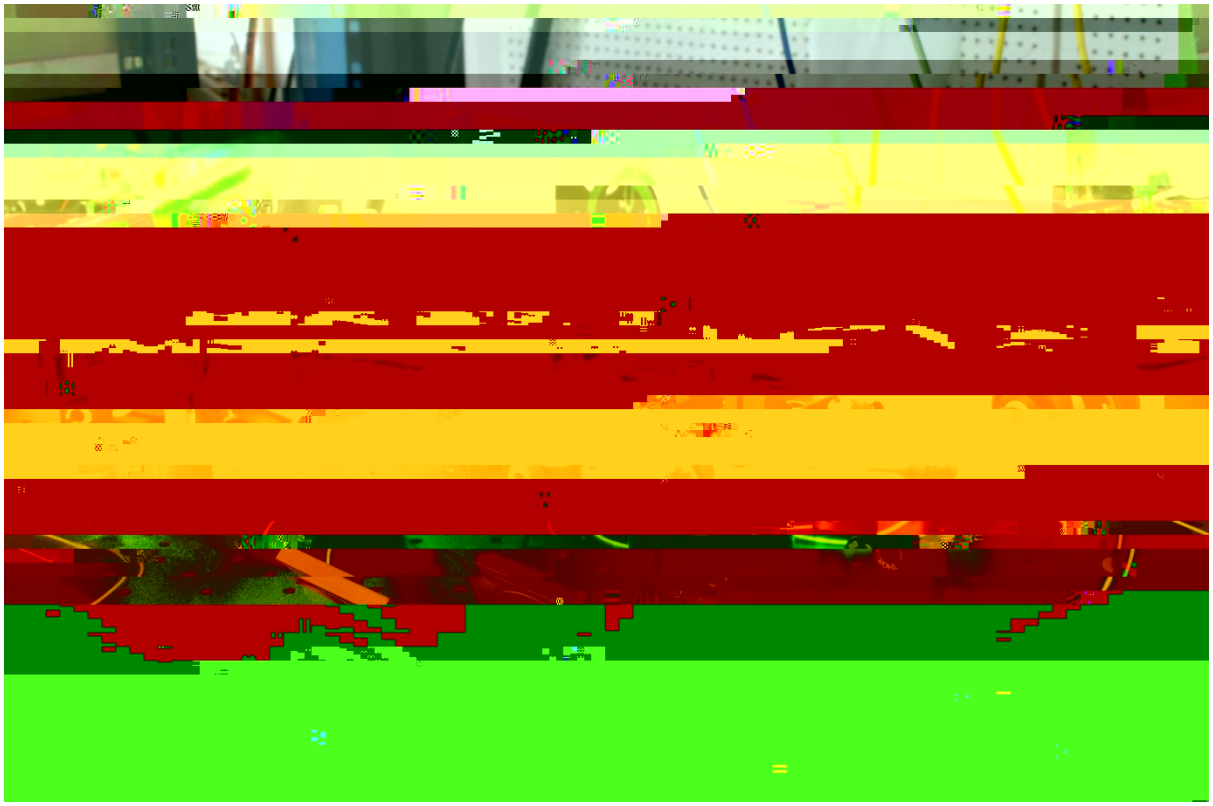
University of

# Safety Code of Practice 21

Edition 7, April 2023

## User guide to safe use of

# LASERS



| Summary | |
|---|---|
| This Guide is concerned with the safe use of lasers and laser-based equipment in the University. It incorporates information on the scheme used to classify lasers; gives guidance on risk assessment for laser applications; and gives guidance on the need for registration of certain types of equipment and certain types of work with lasers. Figure 1 at the start of this document summarises the key responsibilities by function. | |
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Figure 1

# SCOPE

## 1.2. The University Laser Safety Officer (ULSO)

The University Laser Safety Officer (ULSO) is appointed by the University to advise on all safety matters concerned with the use of lasers. The duties are as specified in Appendix 2 to this Code.

Guidance:

The University Laser Safety Officer is a member of H&SS. They may be contacted on tel. extension 4625.

## 1.3. Duties of the School Laser Supervisor (SLS)

A detailed list of duties of an SLS is given in Appendix 1 to this Code. In summary, the SLS is responsible for ensuring that:

- A comprehensive risk assessment is undertaken before any new laser is brought into use;
- All relevant lasers are registered on the University database of lasers via the ULSO;
- Members of the School/Department are correctly advised on matters of laser safety and that they have appropriate safe working procedures to follow;
- Members of the School/Department receive adequate information and training with respect to laser safety matters;
- There is adequate monitoring to check that precautions are suitable and effective, including equipment maintenance, the design of the lab, the staff/student training, and risk assessments;
- Monitor the use of PPE for adequacy and care.

The SLS must ensure that he/ she is fully familiar with all relevant statutory provisions; the requirements of any non-statutory provisions (for example, relevant parts of the IEC BS/EN 60825 Standard on laser safety, BS EN 207:2009 and BSEN 208:2009 laser safety eye protection ); the University's Health & Safety Policy; and any Local Rules regarding laser safety.

## 1.4. Duties of supervisors of laser laboratories and l

such operations.

The risk assessment must identify and take account of all hazards, including “non-beam” hazards – see Section 6.

The risk assessment process for the use of lasers follows the same principles as for any other risk assessment:

- Identify the hazards i.e. the potential for causing harm;
- Identify those at risk of being exposed to the hazards;

## 5.2. Mechanical and physical hazards

Some of the equipment associated with high power lasers is very heavy, and crushing accidents have been reported when units were inadequately secured. The hazards associated with pumps and motors must be given adequate consideration *e.g.* guarding, venting of exhausts, etc. The

No (registered) laser may be taken away from the University *e.g.* for a lecture, a demonstration, or for research purposes, without the permission of the Head of School. The SLS should be consulted before the first occasion on which a particular use off-campus is intended. The operator concerned will be held directly responsiblr51 0 0 1 453.19 721.9 Tmoncer belb 3(r)-5(m2917T/F2 1.9 T

# 13. FURTHER ADVICE AND INFORMATION

**References in the text**

  - systems are set-up and maintained to check that laser safety facilities such as monitors, shielding, beam stops, interlocks, etc are provided where necessary and maintained in a readily usable condition; and
  - other laser safety aspects that legislation or university/area/departmental policy may dictate are catered for.
- Co-ordinating the implementation of advice from the University Laser Safety Officer.
- Periodically reviewing laser safety procedures within the area/department.
- Such other laser safety duties that may be assigned by the Head of Department.

The SLS must ensure that training records are kept of laser safety training received by individuals, plus a copy of the worker registration form where a worker is required to register as a laser user.

| CLASS | PROPERTIES | LABELS | NOTES |
|---|---|---|---|
| Class 1 | Inherently safe,<br>Accessible Emission Limit (AEL) 700 | | |

| CLASS | PROPERTIES | LABELS | NOTES |
|---|---|---|---|
| 302.5 nm – 1mm | | | |

# Laser Registration and Required Controls

*Please detach and retain this page for future reference*

An individual who controls the use of any piece of equipment consisting of, or

School:_____
_

School Laser
Supervisor:_____Extension:_____

Laser Supervisor: _____ Extension:_____

Laser location:
_____

## Laser details:

Make:
_____

Model: _____ Serial Number _____

Type: _____
Mode:_____
*EG*, C02, ARGON-ION, HELIUM, DIODE, NdYAG, etc *EG,* CW - CONTINUOUS WAVE, PULSED

Max Power (mW/J):_____Wavelength(s) (nm):
_____
GIVE RANGE FOR TUNEABLES, EG UV, IR

Class: 1 2 2M 3R 3B 4 DELETE AS APPROPRIATE

Date acquired: _____Date of
disposal:_____
H&SS USE ONLY

This registration form is linked to the risk assessment reference
no.....as described on the attached form RA-2L

*Do not forget to include details of beam expanders, secondary optics etc, and associated hazards such as cryogenics, high voltage; cooling water; gas supplies etc. on the completed RA-2L form.*

CONTINU./RC

Please tick the appropriate boxes below for the class of laser that you are registering. Transfer the information to form RA-2L and include any additional controls that will be required to prevent exposure to risk. Boxes that are shaded out do not require the controls listed in that row of the table.

| CONTROLS | 1 | 2 | 2M | 3R | 3B | 4 |
|---|---|---|---|---|---|---|
| Remote Interlock<br>- interlocked to the door or the enclosure | | | | | | |
| Key Control<br>- to ensure only authorised personnel use the laser | | | | | | |
| Emission Indicator<br>- may also be sited outside laboratory to give warning of laser in use (Interlock with beam shutter) | | | | | | |
| Beam Shutter<br>- to allow interruption of the beam | | | | | | |
| Beam Stop<br>- to stop the beam within the confines of experimental bench or area | | | | | | |

# Appendix 5 Example risk assessment

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| School / Dept / Unit | Science Studies |
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# VERSION CONTROL LOG OF DOCUMENT CHANGES

| Version | Changes | Author |
|---|---|---|