Date Received: _____ Date Approved: _____ R&LSC# _____

UTSA Application for Laser Use

IMPORTANT: All classes 3b and 4 lasers used at UTSA are required to have an approval from the Radiation & Laser Safety Committee and be registered through the Laboratory Safety Division (LSD) with the State of Texas. Safe laser use and procedural compliance are the responsibilities of the Principal Investigator (PI). An approved application is required for each laser or laser system individually.

Date: _____ **PI:** _____ **Department:** _____

Building: _____ **Room:** _____ **PI's Phone Number:** _____

Specifications of Laser System to be Used

Laser Type: _____ **Class** _____

Manufacturer and Model: _____ **Serial#:** _____

☐ **Continuous Wave** ☐ **Pulsed** ☐ **Both** **Is This A Pumping Laser?** ☐ Yes ☐ No

Continuous Wave Specifications

Wavelength(s) (nm) _____

Max Power (W) _____

Operating Power (W) _____

Pulsed Specifications

Wavelength (nm) _____

Min Pulse Duration (sec) _____

Frequency Repetition Rate Range (Hz) _____

Max Energy (J) _____

Operating Energy (J) _____

Type of Laser ☐ **Gas** ☐ **Liquid** ☐ **Solid State** ☐ Other: _____

Tunable ☐ Yes ☐ No **Simultaneous Wavelengths** ☐ Yes ☐ No

Tunable Wavelength Ranges _____

Beam Diameter (cm) _____ **Beam Divergence (mradian)** _____

Beam Diameter and Divergence were Measured: ☐ 1/e ☐ $1/e^2$ ☐ 50% ☐ Other: _____

User Serviceable: ☐ Yes ☐ No **If No, Service Company:** _____

Check all that Apply to the Laser System	
☐ Manufacturers Operation Manual Availiable	☐ Exposed beam path
☐ Use of cryogens	☐ Use of beam focusing optics
☐ High noise level (>85 dB)	☐ Use of frequency doubling crystal
☐ Chilled-water cooled	☐ Laser cutting/welding
☐ Self-modified laser	☐ User-fabricated laser
☐ Use of compressed gases Specify _____	
☐ Involves high voltage applications Specify _____	

Laser Safety Eyewear Information			
Manufacturer	Optical Density @ Wavelength(s) Protected	ANSI Approved (Y/N)	Available Onsite (Y/N)

	Personnel Training Table (To be completed by PI, Co-PI, Lab Manager, Lab Technicians only) *For students/volunteers-Complete and Maintain Appendix A for lab records.				
Name (First-Last)	ABC/123	Title	Laser Course in SciShield/CampusOptics- Completion Date	Laser User Laboratory Specific Training -Completion Date	Comments

Required Attachments

Note: Attach and Label each response to the following questions with the corresponding number. If a question does not apply, then please check the *does not apply* box for that question.

1. I have attached the Manufacturer's laser specification sheet.
   ☐ **I have attached the appropriate response** ☐ **I have attempted to contacted the manufacturer and the specification sheet was not available.**

2. Laser Location: Attach a sketch of the location of the laser system(s) in the designated room and/or provide photos of the lab and laser location.
   ☐ **I have attached the appropriate response** ☐ **Does not apply to this laser system**

3. Provide a brief outline in terms of the application of the laser system(s) for the project (Attach additional pages as necessary).
   Note: The committee approval process is not to evaluate the nature of the research or the appropriateness of the application of lasers to the research activities, but to identify safety issues related to the project.
   ☐ **I have attached the appropriate response** ☐ **Does not apply to this laser system**

4. Attach standard operating procedures (SOPs) for the alignment and operation of each laser system (follow guidance at the end of this document for writing SOPs).
   ☐ **I have attached the Alignment SOP** ☐ **Experimental SOP Submitted**

5. Is there any chance that gas or aerosols will be formed? If so, what method(s) will be used to prevent inhalation of the released gas or aerosols?
   ☐ **I have attached the appropriate response** ☐ **Does not apply to this laser system**

6. Indicate what methods will be used to define a laser control area. This area is designated where the laser has the potential to cause injury (the entire room, inside laser curtain, behind protective barrier, etc.).
   ☐ **I have attached the appropriate response** ☐ **Does not apply to this laser system**

7. Specify precautions and procedures to be used by personnel to:
   a. Prevent eye and/or skin injuries (attach emergency SOPs).
   b. Prevent unauthorized use or removal of the laser system.
   c. Prevent beam exposure in work areas and in adjacent area.
   ☐ **I have attached the appropriate response** ☐ **Does not apply to this laser system**

8. Statement of previous course(s), training or experience with laser(s)
   a. On-the-Job Training (OJT) -Include copy of OJT signature sheet which includes topic(s) covered.
   b. Experience
   c. Formal Training - Include a copy of any applicable certificates.
   ☐ **I have attached the appropriate response**

9. Have you had any exposures to laser(s) in amounts known (or suspected) to be above the ANSI Z136.1-2000 maximum permissible exposure? ☐ **Yes** ☐ **No** ☐ **Unknown**

With my signature, I certify that the provided information contained in this form is true and correct.

Required Signatures	
Principal Investigator	Date

GUIDELINES FOR STANDARD OPERATING PROCEDURES

- These guidelines are intended to assist laser users in preparing standard operating procedures (SOPs) for laser facilities. The information should be used as a guide to allow you to develop SOPs specific to your laser systems.
- Anyone writing operating procedures should be familiar with laser safety and the UTSA Laser Safety Policy. The UTSA Laser Safety Policy and ANSI Z136.1 require all SOPs for laser facilities to be approved by the LSO. It is recommended that the LSO be consulted early in the development of SOPs for guidance in determination of the specific laser hazards and required control measures.
- For assistance in preparation of your facilities SOPs or laser safety concerns please contact felipe.villnueva@utsa.edu or anthony.vallejo@utsa.edu.

I. **INTRODUCTION**

A. Describe the laser location.

B. Describe the laser(s) by type, classification, and technical specifications (wavelength, power/energy, pulse length, repetition rate, beam diameter and divergence, etc.).

C. Briefly describe the purpose of the operation.

II. HAZARDS

Identify and analyze the specific hazards associated with this laser operation; include beam hazards as well as any non-beam hazards (electrical, hazardous chemicals, high pressure, plume emissions, etc.).

III. HAZARD CONTROLS

Describe the means used to mitigate each of the hazards listed above in the HAZARDS section. Please refer to 25 TAC §289.301, ANSI Z136.1-2000, the UTSA Laser Safety Policy, or the LSO for assistance.

IV. TRAINING REQUIREMENTS

Describe the training requirements for the laser operator and incidental personnel. The laser operator shall have formal training in laser safety as well as hands on training with the specific laser system. Incidental personnel shall be made aware of the specific hazards associated with the laser operation.

V. OPERATING PROCEDURES

List the sequential events that describe the complete operation, including when to implement the hazard control measures. The procedures shall be written for the benefit of the laser operator who must read and understand them to perform the operation safely.

VI. ALIGNMENT PROCEDURES

List the steps used to perform beam alignment on a laser or laser system. Special attention should be given to control measures that can reduce the potential for exposure. Examples for control measures are shutting down the main laser and using an alignment laser, reducing the power/energy of the laser, use of beam dumps for the primary beam, etc. Most laser accidents from the beam occur during the alignment operation.

VII. EMERGENCY PROCEDURES

Describe your planned actions in case of an accident, injury, fire, or other emergency. Include names and phone numbers of those that must be contacted in case of an emergency. The procedures shall include Lab Safety @ 210-458-6230 and UTSA Police @ 911 (campus phone) or 210-458-4911 (cell phone). Also post the emergency procedures in the laboratory.

VIII. RESPONSIBILITY AND REGISTRATION

State the name, title, and phone number (or office location) for the person(s) responsible for ensuring that the operation is carried out in accordance with the SOPs.
All laser systems must be registered with Lab Safety.

Laboratory Safety

LASER USER LABORATORY SPECIFIC TRAINING

Appendix A

PURPOSE

The purpose of this training is to provide sufficient practical training to work with Class 3B and Class 4 lasers successfully and safely. Users should be proficient on the laboratory specific training before the PI/Manager signs off as complete.

This template can be used to create the Laboratory specific SOP. Sign, date, and email LSO. Each activity needs to be noted, signed, and dated.

NAME	
EMPLOYEE ID (abc123)	
SUPERVISOR / PI	
LASER EQUIPMENT TRAINED ON	
LASER TYPE	

LABORATORY SPECIFIC TRAINING REQUIREMENTS

The supervisor, or Principal Investigator, must train individuals on the following items at minimum. Additional necessary training items can be determined by the supervisor and added to this document. This training document must be retained in the laboratory for inspection by the Laboratory Safety Division and as evidence that an employee or student is sufficiently trained to operate the equipment in the facility.

☐ Completed online Laser Safety training

☐ Understands the hazards specific to the laboratory laser device

☐ Reviewed and understands the UTSA Laser Safety Plan

☐ Understands good laser safety practice

☐ Understands emergency procedures for laser related incidents

☐ Reviewed and understands the administrative and engineering controls

☐ Understands, and can select, the appropriate PPE for the laser

☐ Understands the control measures for Class 3b and Class 4 lasers

☐ Understands the non-beam hazards in the facility (compressed gases, cryogens, high voltage) and how to handle these hazards safely

☐ Demonstrates proper use of laser interlocks and curtains

☐ Demonstrates the proper emergency shutdown of the laser

☐ Can perform proper cleanup of the laser work area

☐ Can perform proper set-up, start-up, and shutdown of the laser

☐ Can perform proper alignment procedures (if required)

☐ Understands, and can perform, correct Lock Out Tag Out (LOTO) procedures for the laser devices in the facility

Additional specific training items can be added to the table below.

Add additional rows as necessary

DATE	TIME	ACITIVITY	INSTRUCTOR	INSTRUCTOR AND PARTICIPANT INITIALS

TRAINING COMPLETION

This training should be revisited whenever the supervisor or employee/student believes a refresher is necessary. When new laser hazards are added to the facility training should be conducted on each item.

_____

Supervisor Signature

_____

Trainee Signature