



CALIFORNIA STATE UNIVERSITY, FULLERTON

Environmental Health & Safety
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Laser Use Authorization

LUA No. (EHS Only): _____

Part I – Laser Registration

NOTE: All lasers of Class 3B and Class 4 must be registered with the Environmental Health and Safety Office.

- Please complete this form for each Class 3B or Class 4 laser you plan to acquire (or already have) and email to safety@fullerton.edu.
- An email confirmation will be sent to the applicant within seven days of receipt of Part I and Part II of this LUA application.
- LSO approval is required before putting laser into operation. Allow up to 30 days from receipt of completed LUA application, Part I and Part II.

Section A: Laser Holder and General Information				
Principal Investigator:				
Office Phone No:		E-mail address:		
Laser Operator(s): <small>(Check all that apply)</small>	<input type="checkbox"/> Paid Staff/Faculty	<input type="checkbox"/> Enrolled Students	<input type="checkbox"/> Volunteers / Interns	<input type="checkbox"/> Visitors
Laser Manufacturer:				<input type="checkbox"/> CSUF Fabricated Laser
Model Number:		Serial Number:		CSUF Property #
Type of Laser Equipment:				
Type of Registration	<input type="checkbox"/> New Laser/laser system acquisition or installation <input type="checkbox"/> Alteration/transfer/status change of an existing laser system* (Explain in <i>Comments</i> section below.)			
Section B: Location and Laser Details				
Department:		Building:		Room Number:
Laser Classification (Check One):	<input type="checkbox"/> Class 3B (5-500 mW) or (≤ 125 mJ pulsed)		<input type="checkbox"/> Class 4 (>500 mW) or (> 125 mJ pulsed)	
Active Medium (i.e., Argon, Ruby, Nd:YAG, Diode):				
Tunable Laser? (Check One)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<i>Details</i>	
Wavelength(s) (nanometers):				
Beam Divergence	mrad			
Beam Diameter at laser output:	mm			
Purpose and Frequency of Use:				
<input type="checkbox"/> Research <input type="checkbox"/> Classroom				
<input type="checkbox"/> Continuous Wave	Average Power (W)		Maximum Power (W)	
<input type="checkbox"/> Repetitively Pulsed	Energy per Pulse (J)		Pulse repetition frequency (Hz)	
<input type="checkbox"/> Single Pulse	Pulse duration (nsec)		Pulse width (s)	
<input type="checkbox"/> Q-Switched	Peak Pulse Power (W)		Peak Power Density (W/cm ²)	

Please check all items that apply to your operation:

- | | | | |
|---|---|--|---|
| <input type="checkbox"/> Invisible Beam (IR or μ v) | <input type="checkbox"/> High Voltage (660V) | <input type="checkbox"/> Multi-Use Room | <input type="checkbox"/> Public Theater |
| <input type="checkbox"/> Exposed Beam Path | <input type="checkbox"/> Beam Focusing Optics | <input type="checkbox"/> Outdoor Use | <input type="checkbox"/> Creative Arts |
| <input type="checkbox"/> CSUF Modified Laser | <input type="checkbox"/> Frequency-doubling Crystal | <input type="checkbox"/> Laser Cutting/Welding | <input type="checkbox"/> 3-D Printer |

Comments

Laser Use Status Ready to Use In Storage (useable, stored) Needs Repair (not useable)

PI Signature: _____ Date: _____

By manually signing this form or printing my name electronically, I acknowledge that all statements are true and accurate. I certify the laser(s) will be used as described in this application and that all applicable provisions of the State of California Code of Regulations pertaining to the use of lasers and all CSUF policies, guidelines, and standard operating procedures and specific approval conditions required by the LSO now or hereafter in effect will be observed.

*Alterations include any changes(s) that substantially increases or decreases the output or wavelengths produced. Relocation from one work space to another or transfer to a new owner is also an "alteration".



Laser Use Authorization

Part II – Laser Use Details-Required for LUA

A. Diagram of laser or laser system set up.

Show location of beam stops, interlocks, shielding, mirrors and other relevant details or attach drawing.

FOR LASERS MOTHBALLED AND NOT USED:

1. This laser is in storage and not in use. _____ *Initials*
2. I understand that I will notify the LSO if there is any change, such as prepare it for use or if I dismantle/discard or sell/transfer it.
3. If I decide to put this laser/laser system into use, I will fill out Part II of the LUA application and submit it to the LSO.

B. Administrative

Please attach written safety operating procedures (SOPs) for such tasks as **Alignments, Emergency Shutdown, Powering-up, and Laser Eyewear Use** with this LUA application.

By my signature, I acknowledge that I may not begin using the laser until my Laser Use Authorization has been approved by the Laser Safety Officer (LSO).

Authorized Principal Laser Operator Signature

Date

LSO Signature

Date



C. Security and Access Control

GOAL: Preventing unauthorized people from entering the laser control area

- 1. How will you prevent unauthorized users from entering the control area? How will you protect visitors, custodians or other "civilians" when the laser is operating? Examples: Locks on doors, warning lights, signs, training.

Empty rectangular box for response to question 1.

GOAL: Preventing the laser beam from leaving the optics table or controlled area

- 2. Describe your interlocks or other engineering controls. Examples: Interlocked doors or gates, use of beam stops or dumps, barriers, and shields (opaque and fire resistant). If none, explain your alternative methods.

Empty rectangular box for response to question 2.

GOAL: Preventing unauthorized access or accidental contact with the laser beam of non-laser users in the room/area.

- 3. Describe the engineering or management controls you will have in place to prevent room occupants contact with the laser beam. Examples: infrared and ultraviolet sensor cards, infrared viewers, partitions, lab rules, barriers on optics table to protect users working at computers, etc.

Empty rectangular box for response to question 3.

D. Personal Protective Equipment

- 1. Is eye protection required for entry or certain tasks? [] Yes [] No If NO eye protection will be required, please explain.

Horizontal separator line

- 2. When will you require laser users to wear eye protection?

Table with 5 columns: Question, YES/NO checkboxes, Specify details (if applicable), What wavelength(s) are you protecting against?, Duration of Exposure, Specify eyewear required. Rows include: At all times when using the laser?, During alignment?, For entry into control area?, For entry to room? (incl. visitors)

- 3. Specify the type of protective eyewear available to laser users in this area.

Table with 4 columns: Brand, Model, Rated Wavelength, O.D. and 3 additional columns for eyewear specifications. Rows labeled A, B, C, D.



Not necessary to print this page.

Appendix: Hazard Assessment Guide

Evaluating a work operation for operational efficiency and potential safety hazards is one of the basic responsibilities of a lab manager and, in fact, is a basic component of Cal-OSHA’s required Injury and Illness Prevention Program. Performing a hazard assessment to identify work hazards is essential to creating a safe work area. Before you can minimize risks, you need to know what the risks are. The chart below summarizes hazards and protective measures common to laser operations.

1. Example of a hazard assessment

Common Laser Beam Hazards	Indirect Laser Hazards	Protective measures that minimize risk of injury
Invisible beams (infrared, ultraviolet) Person leaning across a beam path Contact from escaping beams <ul style="list-style-type: none"> ▪ Damaged or burned clothing ▪ Burned or damaged skin or eyes ▪ Escaping beam causing combustible materials to burn – fire hazard ▪ Damage to walls and equipment Direct or reflected viewing of beam <ul style="list-style-type: none"> ▪ flash blindness ▪ temporary vision loss ▪ damaged cornea ▪ burned retina 	Reflective surfaces <ul style="list-style-type: none"> ▪ Jewelry ▪ Mirrors ▪ Shiny metal objects Toxic or pressurized chemicals <ul style="list-style-type: none"> ▪ Off-gassing of dyes and chemicals ▪ Hazardous chemical exposure ▪ Compressed gases ▪ Cryogenic fluids ▪ Explosion of high pressure lamps Electrical <ul style="list-style-type: none"> ▪ High voltage ▪ Electric shocks ▪ Electrical fires 	<ul style="list-style-type: none"> ▪ Securing beam stops ▪ Shielding to contain stray beams ▪ Using low power alignment lasers ▪ Restricting access ▪ Wearing eye protection ▪ Warning signs clearly posted ▪ Mapping the beam path(s) ▪ Removing jewelry ▪ Using interlocks ▪ Training ▪ Locking out during maintenance ▪ Using lowest practical power ▪ Consistently enforcing safe practices

2. Note commonly observed unsafe practices that cause preventable laser accidents:

- Not wearing protective eye wear during alignment
- Misaligned optics and upwardly directed beams
- Malfunctioning equipment
- Improperly handling high voltage components of the laser system
- Lack of consideration for non-beam hazards – electric shock is the main cause of serious injury and death
- Bypassing interlocks and housing on doors and laser
- Turning on the power supply accidentally – not following required lockout procedures
- Wearing the wrong eye wear for the laser being used
- Operating unfamiliar equipment – lack of training and awareness of risks
- Intentionally exposing unprotected personnel – horseplay

3. Example of an SOP for alignment with included hazard assessment

Laser users can prevent laser-related accidents. According to a former LSO at Lawrence Berkeley National Laboratory, 60% of laser accidents in research settings occur during the alignment process.

Task: Alignment

Potential Hazards	Protective Measures	SAMPLE: Alignment Procedures
1. Beam hitting an eye 2. Beam hitting flammable or combustible materials 3. Injury to visitors 4. Beam escaping confines of the optics table	<ul style="list-style-type: none"> ▪ Isolate the area during alignment ▪ Choose the correct eye wear ▪ Wear the provided eye wear ▪ Mark the back side of each beam stop ▪ Double-check beam stop locations ▪ Use the lowest practical power setting ▪ Take off jewelry ▪ Set beam paths below eye level of people working in the area ▪ Clearly mark any beam directed out of a horizontal plane ▪ Don’t allow unauthorized or unnecessary people in the room during alignments 	1. Put up a shielding curtain. 2. Make sure warning sign “ <i>Keep Out. Alignment in progress</i> ” is visible. 3. Put on the orange UVEX laser goggles. 4. Check beam stop locations and secure them. 5. Power up the system. 6. Take the He-Ne alignment laser and align the beam as required. 7. Identify and terminate each and every stray beam coming from any optical component moved. 8. Make sure beam paths are at a safe working height below the eye level of the user(s) before you leave.