

# Physics 3108

## Lab 5: LEDs & Lasers



## Appendix

Note that this Appendix may grow, so it is in your best interest to reload the document occasionally.

### Python Code

The code should be based on the Python code using in Lab 3 which controlled the current source. Like in Lab 3, you should choose the initial and final currents for the current sweep. The code should then record actual current, voltage across the device and photocurrent (which can also be converted to optical power in your code as a bonus element – but this may be trickier than you think).

### Laser testing

Semiconductor lasers are **VERY** static sensitive. In addition, they cannot handle large currents/voltages or even short pulses. This means that if you connect the laser to your current source without precautions, the laser will likely be destroyed before you have a chance to test it. The reasoning is as follows:

- When there is no device connected to the current source, the output voltage is likely greater than 3V.
- Thus, when the laser is connected there is a very short, high pulse of current through the device, which destroys it.

Solution:

- Use a wire to short the output of the current source (connect the output to ground).
- While this wire is in place, connect the laser to the current source.
- Ensure that the voltage (or current) is reset to zero after each sweep, to ensure that prior to a sweep your code will try to source the minimum current.
- Disconnect the shorting (or grounding) wire prior to measuring the laser.
- Once measured re-attach the wire.

This has also been discussed in the lecture. Feel free to ask questions at any time to avoid destroying your laser.