

**Advanced Manufacturing and Integrated Photonics Certificate Program (AMIP)**

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**Course module: Tools and Testing Equipment**

Topic 1

Topic title: Overview, Safety, & Measurement Basics

Author: Bruno Nosiglia

**SAFETY NOTICE:** Safety should always be your top priority. While engaging in any actual or practical experiments or the implementation of any activity or exercise discussed or referenced in these course materials, be certain to learn about and take all necessary and appropriate safety precautions, including, without limitation, abiding by electrical, optical, and laser protocols and wearing any and all appropriate protective coverings and eye protection. Be advised that your engagement in any course, including any actual or practical experiments or the implementation of any activity or exercise discussed or referenced in these course materials, is entirely at your own risk. The authors and owners of these course materials hereby disclaim any and all liability with respect to your engagement in any course, including your participation in any actual or practical experiments or the implementation of any activity or exercise discussed or referenced in these course materials.

**Overview, Safety, & Measurement Basics**

**Goals:**

* **To provide an overview of the Photonics industry.**
* **To understand the responsibilities of working safely.**
* **To learn basic measurement methods.**

1. **Videos & PowerPoints**
   1. What is Photonics?
      1. Video: <https://www.youtube.com/watch?v=PljbV-wsxeg>
      2. PowerPoint:

[Lab Safety.pptx](Lab%20Safety.pptx)

* 1. Safe lab practice while using measuring tools – PowerPoint

[Safety & using basic measuring tools.pptx](Safety%20&%20using%20basic%20measuring%20tools.pptx)

* 1. Who is OSHA?
     1. <https://www.youtube.com/watch?v=hMVGtnBwH7s>
  2. How to safely use calipers
     1. Video: <https://www.google.com/search?rlz=1C1GIGM_enUS674US674&ei=tulvXtC6NsWlytMP_LaFqAk&q=how+to+use+a+caliper&oq=how+to+use+a+caliper&gs_l=psy-ab.1.0.0l10.324958.326516..328268...0.3..0.111.548.6j1......0....1..gws-wiz.......0i71j0i67j0i10.9KuEfr-UHOw#kpvalbx=_AOtvXu65BqKOggeUkaWgBA35>
  3. How to safely use micrometers
     1. Video: <https://www.youtube.com/watch?v=2-cm_ocn9p4>
  4. Mechanical (engineering) drawing
     1. Video:

<https://www.google.com/search?rlz=1C1GIGM_enUS674US674&ei=AOtvXu65BqKOggeUkaWgBA&q=how+to+read+a+mechanical+drawing&oq=how+to+read+a+mechanical+drawing&gs_l=psy-ab.3..0j0i22i30l9.653692.661713..663275...0.3..0.98.1809.25......0....1..gws-wiz.......0i71j0i67j0i131.PxUZCxncZXo&ved=0ahUKEwjuucnc85_oAhUih-AKHZRICUQQ4dUDCAs&uact=5>

1. **Handouts**

**Prefix sheet**



**Mechanical Drawing Sheet**

[**mechanical drawing sheet 3.0 - w diameter symbol.docx**](mechanical%20drawing%20sheet%203.0%20-%20w%20diameter%20symbol.docx)

1. **Projects, Discussions, and Written Assessment**

**Project 1.0:**

[Project 1.0 class discussion safety photonics roles in industry.doc](Project%201.0%20class%20discussion%20safety%20photonics%20roles%20in%20industry.doc)

**Project 1.1:**

[Project 1.1 examine & discuss various measuring tools - team format.doc](Project%201.1%20examine%20&%20discuss%20various%20measuring%20tools%20-%20%20team%20format.doc)

**Project 2.1: Measuring objects**

[Project 2.1 measuring objects using precision tools - team format.doc](Project%202.1%20measuring%20objects%20using%20precision%20tools%20-%20%20team%20format.doc)

[Project 2.2 measuring interior dimensions of objects using precision tools - team format.doc](Project%202.2%20measuring%20interior%20dimensions%20of%20objects%20using%20precision%20tools%20-%20%20team%20format.doc)

**Project 2.2: Identifying & using numerical prefixes**

[Project 2.2 identifying and using numerical prefixes - team format(1).doc](Project%202.2%20identifying%20and%20using%20numerical%20prefixes%20-%20%20team%20format(1).doc)

**Project 3.1: Reading Mechanical Drawings**

[**Project 3.1 reading mechanical drawing & comparing to measured dimensions - team format.doc**](Project%203.1%20reading%20mechanical%20drawing%20&%20comparing%20to%20measured%20dimensions%20-%20%20team%20format.doc)

**Project 3.2: Comparing Mechanical Drawing to Measured Dimensions**

[Project 3.2 comparing mechanical drawing to measured dimension to determine if in spec - team format.doc](Project%203.2%20comparing%20mechanical%20drawing%20to%20measured%20dimension%20to%20determine%20if%20in%20spec%20-%20%20team%20format.doc)

1. **Supplies or equipment required:** 
   1. Projector with screen
   2. Calipers/ micrometers
   3. Bolts, blocks, metal washers
   4. OSHA online training seats