

# Principles of Physics I and Lab

## [2017 Spring Semester]

The following materials and equipment are **required** for this course. Please read this document carefully and thoroughly.

- Free items

The following items can be obtained without purchase, although a store-bought ruler, protractor, or meter stick may be preferred. Some substitutions may be allowed.

Item	Source	Note
30 cm Ruler	<a href="#">Paper 30 cm ruler pdf file</a>	For best results, print the file on heavier paper such as card stock.
Protractor	<a href="#">Paper protractor pdf file</a>	For best results, print the file on heavier paper such as card stock.
Meter-long Tape	<a href="#">paper cut-out meter tape pdf file</a>	There are two meter-long measuring tapes per page. Cut out and tape together the sections carefully. The finished product can be attached to a yardstick or wooden slat to make a 'meter stick'.
Timer	<a href="#">Link to an on-line stopwatch</a>	Choose the 'stopwatch' option.
Logger Pro Graphing Software	www.vernier.com	Your instructor will provide instructions for downloading and installing this software.  Please watch the tutorial - <a href="#">How to use Logger Pro.</a>

- Office Supplies

The following items can be purchased at any office supply store, or a store that has a Home and Office section. Examples are given.

Item	Dollar Tree	Dollar General	Walmart
30 cm Ruler	'Jot' brand, 2-pk	DG brand, \$0.50	plastic, \$0.32
Protractor	'Jot' brand, with a compass		'Fiskars' brand, \$2.97, with a compass

String or Thread	'Craftsman's square' brand, thread 3-pk.	'Sewing Patch' brand, thread 3-pk, \$1.00	'Prym' brand, sewing kit, \$1.00
Paper Clips	'Jot' brand, 250-ct	DG brand, \$1.00	'Casemate' brand, 100 ct, \$1.24
Rubber Bands	'Jot' brand, 3.5 oz	DG brand, \$1.00	'Advantage' brand, \$0.67
Tape	'Jot' brand, invisible	DG brand, \$1.00	'Casemate' brand, \$0.97
Marbles	A bag of 50 marbles and a shooter	'Imperial' brand, \$1.00 50 plus a shooter	
Slinky	plastic Magic Spring	plastic Rainbow Spring, \$1.00	original metal slinky(TM) \$3.00

- Specialty Items

The following items are required for certain experiments but are less likely to be found locally or in a general store.

Items	Source(s)	Note
0.5 N Spring Scale	<a href="#">Amazon purchase link</a>	A spring scale is needed for five of the experiments, beginning with Lab #2.
Meter Stick/Yard Stick (x2)	<a href="#">Lowe's Purchase Link</a> \$0.98 ea.  Walmart \$1.42 ea. in the sewing section	Two yardsticks may be used to make a ramp by taping them together with a cardboard backing. A groove down the middle will guide the marble down the ramp.  One yardstick is needed for Lab # 11.  The meter-long measuring tape can be attached to a yard stick to make a 'meter stick'.
Slinky <sup>(TM)</sup>	<a href="#">Amazon Purchase Link</a>	If a Slinky <sup>(TM)</sup> can't be found locally, here is a link to one at Amazon.

- Common Items

Some of the experiments require common items typically found around the home. Special purchase is not required: for example, any small item about the size of a house key can be used to make a plumb bob.

Item	Experiment(s)	Note
A small weight, such as a house key	<ul style="list-style-type: none"> <li>• Lab #1: Graphing Data</li> <li>• Lab #10: Collisions in Two dimensions</li> </ul>	The weight attached to a string serves as a pendulum for Lab #1 and a plumb line for Lab # 10.

Thread or twist tie	<ul style="list-style-type: none"> <li>• Lab #2: Vector Addition</li> </ul>	The thread is used to tie three rubber bands together.
Large-size book, at least 8.5" x 11"	<ul style="list-style-type: none"> <li>• Lab #2: Vector Addition</li> </ul>	The book is the frame to stretch the rubber bands.
CD case or paperback book	<ul style="list-style-type: none"> <li>• Lab #5:Frictional Force</li> </ul>	The case or book is dragged across a flat surface.
Three 12-oz plastic water bottles	<ul style="list-style-type: none"> <li>• Lab #5:Frictional Force</li> <li>• Lab #9: Energy Conservation</li> </ul>	The bottles are used as weights; other objects of similar mass may be used instead.
Medium-sized book	<ul style="list-style-type: none"> <li>• Lab #9: Energy Conservation</li> </ul>	Any objects suitable for dragging against friction or hanging from a rubber band can be used.
Can of soda, paperback book, etc.	<ul style="list-style-type: none"> <li>• Lab #11: Static Equilibrium</li> </ul>	Any objects suitable for hanging may be used.
Any grocery item in a can	<ul style="list-style-type: none"> <li>• Lab #12: The Rolling Can</li> </ul>	This is the rolling can.