



Snow Science 101 Information Package

Introduction

Your backcountry safety education continues with our Snow Science 101 course. In order to move safely in the mountains, you need to learn how to look at the snow under your feet. In this one-day field course, you will learn how to quickly gather relevant snowpack information. We will show you how to effectively and efficiently gather snowpack data to aid your decision making.

Learning outcomes:

- The challenges of digging profiles, when not to dig and how to do it safely.
- The pitfalls of doing tests.
- How to do an extended column test, compression test and deep tap test and interpret the results.
- How to do hand shears and burp tests.
- How to look for and identify weak layers in the snowpack
- Intermediate understanding of the snow metamorphosis and how it relates to avalanches.

Pre-course Material

Here's a list of what you need to do before the course :

- Familiarize yourself with your gear. You do not want to be spending time in the class figuring out how your bindings work or if your skins fit your board or skis.
- Download the Avalanche Canada App. [Android here.](#) [Apple here.](#) Please be familiar with the current conditions when you show up.

- Download this [Clinometer](#). There is a similar one on Apple
- Watch [this video](#) and learn the basics of snowpack tests. Pay close attention to the compression test, deep tap test and the extended column test.
- Watch [this video](#) to understand fracture character on compression tests.
- Watching these two videos will help you get way more out of this course!
- Go to Facebook and like [Kootenay Backcountry Guides](#). Check out our snowpack updates from the field there. Join our FB group called Kootenay Backcountry Touring Group.

Day 1:

Location: Meet at **7:30 am** at the east side of the parking lot outside of **Railtown Coffee House**. We are heading to Whitewater Backcountry.

Schedule: Meet at **7:30 am**. We should be back down to Nelson between 4 and 5 pm.

Equipment needed, please see the equipment list below.

- We will head to the area decided on in the morning of. Please be prepared for a long day in the mountains.
- We will spend time standing around, so bring extra warm layers if the weather is cold.
- Bring food and hot beverage along with everything laid out in the equipment list that is also attached to this email.

Snow Science 101 Equipment List

Having the proper gear will allow you to maximize your learning on this course. Please follow this list to make sure that you have all of the proper equipment.

Your preferred methods of travel:

Alpine Touring Bindings: These are downhill skis with a touring binding. Bindings come in a couple of styles:

1. Tech bindings. This binding has pins that connect with holes in the toe of your boots. You need to have Tech Toe boots for these bindings to work. See [this image](#) for an idea of what we are describing. If you want a lightweight tech binding, the [Dynafit Radical](#) is a great example. The [Marker KingPin](#) is a decent choice that combines a regular releasable heel with a tech style toe piece. There are many

options available for different tech bindings and boot combinations. One challenge with tech bindings is that they do not adhere to the DIN system and can be hard to operate. The [Solomon Shift](#) binding has tried to deal with the DIN issue by making a regular binding that turns into a tech binding for the climb. There are others coming on the market that do the same.

2. **Frame Bindings.** This is where there is a regular toe and heel piece but the heel can unlock. See [this image](#) for details. One challenge with frame bindings is that they are heavy. We do not recommend heavy frame bindings like the Marker Duke. These bindings are designed for very short tours of less than 45min in duration. We have seen many people unable to finish their days because they have heavy bindings.

Telemark skis: These are becoming less and less popular as the world of alpine ski touring grew as equipment has changed with innovation. This system can be challenging. Releasable bindings are highly recommended as this is a major safety advantage.

Splitboarding: This is the most effective and lightweight way to snowboard in the backcountry. As technology has improved over the last 5 years split-boarding has been the go-to for all snowboarders in the backcountry. You need to purchase splitboard bindings. The [Spark Binding](#) set up or the [Burton Hitchhiker](#) are the most popular. Check out [Tribute Board Shop](#) in Nelson for your splitboarding needs.

Snowshoes: It is possible to do the Snow Science 101 course on Snowshoes.

Boots: Those who choose Alpine Touring will want to have Alpine Touring Boots with Vibram Soles. Please make sure that if you have a tech binding, you buy boots with a tech toe. See the (**Alpine Touring skis/bindings section for details**). Alpine Touring boots are designed for walking and skiing. They have a walk mode that allows your ankle to flex and a rockered sole for easy walking. Downhill Alpine boots are not recommended, even ones with a walk mode, these boots are significantly heavier and less comfortable than an Alpine Touring boot. We have seen many people unable to finish their days because they bring heavy boots.

Splitboarding Boots: Pretty much all snowboarding boots work with Splitboard bindings. Make sure you get boots that are designed for long walks.

Backpack: Having a properly fitting backpack is crucial to having a comfortable day in the backcountry. We recommend a pack between 30 and 45L. The best packs have compartments for your avalanche safety gear. Please make sure your pack has attachments to carry your skis or snowboard in the event that we bootpack to a summit. Having a helmet holder is also important.

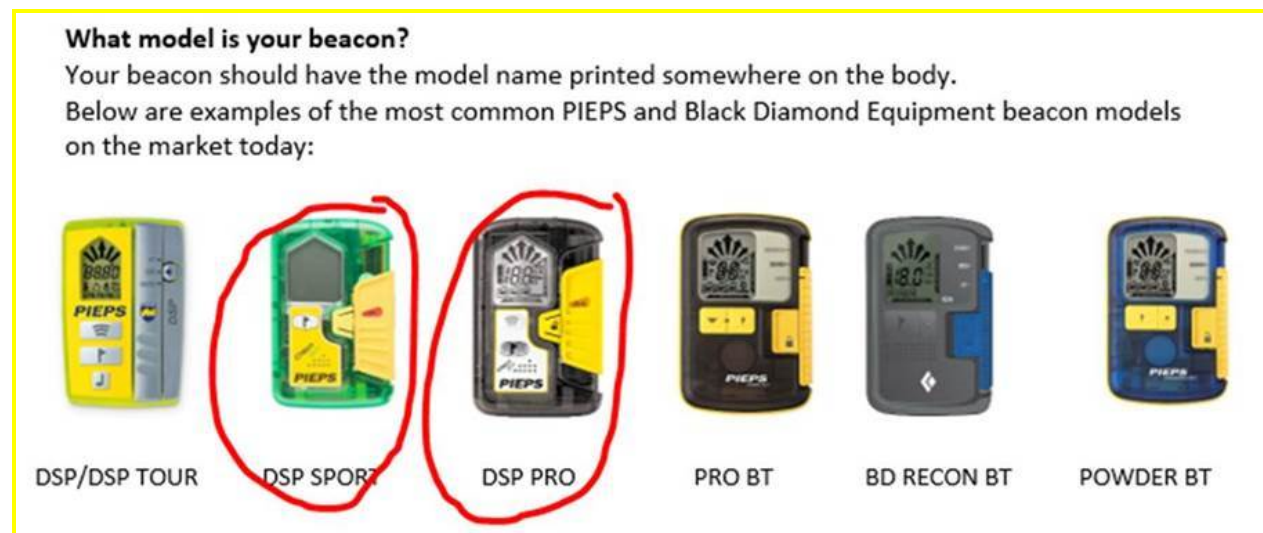
Avalanche Safety Gear:

Transceivers: You need to have a modern triple antenna digital transceiver, we do not allow analogue or dual antenna transceivers on our trips or courses. All new modern triple antenna transceivers are good. Select one that you think fits your needs. **You should be very suspect of purchasing transceivers on Facebook Marketplace or from other used gear sources. You do not know how that transceiver has been treated or how old it is.**

See [this video](#) for an overview of what to look for in transceivers.

If you are looking for a good site to check out all the different transceivers and what features are available. Go to <https://beaconreviews.com/>

Please note that if you have a Pieps DSP Sport or Pro, these transceivers have issues with their lock buttons. Please take them to your local gear shop to get them checked out.



Shovel: Shops offer a wide range of excellent shovels. Do not buy plastic or super lightweight shovels. Check out [this video](#) for what to look for in a shovel.

Probe: Make sure you are buying a high-quality probe that is easy to put together.

See [this video](#) for what to look for in a probe.

All new models have a quick snap to lock the probe in place, we do not recommend screw in tops for avalanche probes. BCA makes great probes at a reasonable price. We recommend that your probe is 300cm or longer.

Skins: Choose a skin that is appropriate for your skis or splitboard. Make sure to follow the instructions carefully when setting them up. G3 Alpinist Skins are a really great easy skin to set up, they make them for both Skis and Splitboards.

Airbag Packs: Avalanche airbags are **not** mandatory on our courses or trips. European studies show they significantly reduce your chances of being buried in an avalanche. There are many different makes and models to choose from and range from \$700 to \$1800. These can be rented from [Roam Shop](#) in Nelson B.C.

*** Please make sure that all of the above equipment is modern and in good working order. It is not a good idea to try out brand new boots on this course as you might end up with blisters from uncomfortable boots that make it difficult to complete the tours.

Outerwear:

- High quality waterproof breathable shell and pants.
- Warm toque.
- Ski boots or snowboard boots.
- Helmet, which should be lightweight for carrying
- 2 pair of water-resistant gloves or mitts
- High-quality ski or snowboard socks
- Long underwear top and bottom
- A warm Puffy Thinsulate or down jacket
- Goggles and sunglasses
- Sunscreen
- Lunch and snacks
- A thermos of tea or coffee for the day
- 1 litre water bottle
- Optional. A high-quality camera
- Phone for pictures
- Always travel with a lightweight headlamp in your pack for emergency use.

Other Gear:

- A map of the local area. You should get a copy of the area that the course is taking place in. [Backcountry Skiing Canada](#) makes excellent maps for Kootenay

Pass, Whitewater and the Rossland Range. These maps can be found at ROAM or Valhalla Pure in Nelson

- Download this inclinometer at [Google Play](#) or [iTunes store](#).
- Download the Avalanche Canada App. [Android here.](#) [Apple here.](#)
- A snow saw for snow profiles or making emergency shelters or getting firewood. Check out the [G3 Bone Saw](#) or this [BCA snow saw](#).
- Ruler - you will want a small collapsible ruler for measuring snow depths. 1m or 2m are both good. If you have a probe that has measurements on it you can use that. But it is best to have a dedicated ruler.
- A snow specific thermometer.
- A snow crystal screen, the snow saws above have crystal screens on them so if you have one of these you do not need a crystal screen.
- A magnifying loupe for looking at snow crystals.
- A 5m 2mm rope. This is for cutting snow in profiles and ruche blocks.
- A pencil for writing in the field.

Renting and Purchasing Equipment:

[ROAM Shop](#) in Nelson rents transceivers, shovels, and probes. They also rent tech binding equipped touring skis, boots, poles and a wide selection of splitboards. We have teamed up with [ROAM Shop](#) to offer all registered program participants renting gear to take one day's cost of gear rented from them off the purchase price of new gear. This means you can test out gear you are thinking of buying. Also, you get a 10% discount on rentals and 5% discount all purchases of new gear at [ROAM Shop](#). Please make sure you **let them know you are a registered participant in a KBG program at the time of purchase!**

Check their rental fleet [HERE](#) and fill out the [Winter Rental Waiver Form](#) as soon as possible.
