SEATTLE MOUNTAINEERS BASIC SNOWSHOE COURSE

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INTRODUCTION

Whether you prefer the camaraderie of new friends on an easy trip through splendid winter scenery or the challenge of bagging a snow-covered peak, our course will show you the skills you need to enjoy backcountry travel in winter.

The goal of this course is to teach students to be safe, confident snowshoers and to enjoy winter fitness, nature and adventure. Instruction is geared to enjoying easy, relatively low-elevation gain snowshoeing trips in lower-risk avalanche terrain areas.

The Mountaineers is not a guide service. The Snowshoe Committee, instructors and trip leaders are volunteers who will spend many hours helping you learn the pleasure and techniques of snowshoeing. You are an equal participant, responsible for your safety and progress in the course and on all outings.

Course Lecture

For the 2020-21 season, these are conducted online via zoom.

The course includes two online sessions, (1) a lecture intended to explain key snowshoeing principles and concepts, supplement the reading material, and (2) a field trip preview session to provide specific information on upcoming field trips and other trips that you may participate going forward, answer questions and clarify policies and procedures.

Course Field Trip

The field trip is your opportunity to practice the techniques presented in the lectures and reading material under the guidance of experienced instructors. Each field trip covers material in a limited amount of time.

Your performance on the field trip will be evaluated and discussed with you by your trip leader/instructors. In order to get the most benefit out of the field trip, you should do the following:

- Prepare for the field trip. Review lecture material, reading material and handouts.
- Visualize practicing the techniques beforehand.
- Be prepared for a full, long day at the field trip. Don't bring family, friends or pets.
- Arrive early enough to park and make whatever preparations are necessary so you can be ready to begin at the starting time.

Please remember that your instructors and leaders are all volunteers. They all have something to teach you and deserve your attention and courtesy. Everyone is there to help you and to answer your questions – the only foolish question is the one not asked.

Note: It is Mountaineers policy that alcohol and controlled substances may not be used before or during Mountaineers trips and field trips.

Primary Texts

Mountaineering: The Freedom of the Hills (8th ed.), 2010 (hereafter, "Freedom")

Avalanche Essentials, A Step-by-Step System for Safety and Survival, B. Tremper, 2013 (hereafter, "Tremper")

Both texts are available at the Mountaineers' Bookstore (members get a 20% discount).

Highly Recommended Texts

Staying Alive in Avalanche Terrain (2nd ed.), B. Tremper, 2008 (hereafter, "Tremper")

Wilderness Navigation: Finding Your Way Using Map, Compass, Altimeter & GPS, B. Burns & M. Burns, 1999

Mountaineering First Aid: A Guide to Accident Response and First Aid Care, J. Carline, M. Lentz & S. Macdonald, 1996

Snow Sense: A Guide to Evaluating Snow Avalanche Hazard, J. A. Fredston, D. Fesler & D. S. Fesler, 2001

The Avalanche Handbook, D. McClung and P. Schaerer, 1993
Conditioning for Outdoor Fitness: A Comprehensive Training Guide, D. Musnick, M. Pierce, S. Elliott, & M. Pierce, 1999
Snowshoeing: From Novice to Master, G. Prater, (5th ed.) 2002
Northwest Mountain Weather: Understanding and Forecasting for the Backcountry User, J. Renner, 199

TRIPS

The Snowshoe Code

- Leave the trip itinerary with a responsible person.
- Carry necessary clothing, food and equipment.
- A trip party of three is a minimum.
- If climbing, rope up for exposed places and glaciers. (Do not attempt without technical climbing training, which is not covered in this course.)
- Keep the party together.
- Never snowshoe beyond ability and knowledge.
- Never let judgment be overruled by desire when choosing the route or deciding to turn back.
- Follow the precepts of sound mountaineering.
- Behave at all times in a manner that reflects favorable upon snowshoeing, including Leave No Trace.

Mountaineers Snowshoe Trips

Each winter, The Mountaineers lead snowshoe trips in the Cascade and Olympic Mountains. Most of the trips are one day, but overnight trips are also sometimes planned. For those interested in overnight trips, the Mountaineers' offers the Winter Camping Course annually.

Basic Snowshoe students and graduates are eligible to participate in Mountaineers' snowshoe trips rated *Beginner* and *Basic* only. In order to participate in *Intermediate* or *Strenuous* trips, participants must have a Winter Travel certification, have graduated from Intermediate (formerly Backcountry) Snowshoe Skills Course or be enrolled in the Intermediate Snowshoe Skills Course, have attended the lecture, and successfully completed the field trip. Graduates of Alpine Scramble and Climbing Courses may also participate in Intermediate and Strenuous snowshoe trips.

To graduate from Intermediate Snowshoe Skills, one must enroll and successfully attend the lecture and two field trips, complete a minimum of three (3) snowshoe trips (two of which must be rated Intermediate or Strenuous), and hold a current Mountaineers' Navigation.

Most trips are open to members of The Mountaineers only. Guests can register for two activities per year (barring any other restrictions, such as proper certification). Trips are listed online at www.mountaineers.org under Explore/Find Activities. Listings include the trip difficulty rating, location, map needed, trip leader information, dates for signing up, and any other instructions. SnoPark Permits and Groomed Trail permits may be required for some trailhead parking as noted. These can be purchased at REI, Forest Service Ranger stations, and many other retail outdoor supply companies.

Trip Rating System

Technical Rating

Beginner: Minimal avalanche danger. Open to all properly equipped members and non-members of The Mountaineers.

Basic: No exposure to steep terrain which would require the use of an ice axe with minimal avalanche danger. Must be a student or graduate of Basic Snowshoeing, and students must have successfully completed the field trip prior to sign-up.

Intermediate: Exposure to terrain that may require the use of an ice axe and/or the use of avalanche tools: beacon, probe, and shovel. Must be a student or graduate of Intermediate Snowshoeing, Alpine Scrambling graduate, or Basic Climbing graduate. Intermediate Snowshoeing students must have successfully completed the field trip prior to sign-up.

Difficulty Rating

Easy: Easy: up to 750 ft. elevation gain, and up to 6 miles round trip. Most likely on an established trail or road.

Moderate: up to 1,500 ft. elevation gain, and up to 8 miles round trip.

Strenuous:up to 2,500 ft. elevation gain, and up to 10 miles round trip.

Very Strenuous: over 2500 ft. elevation gain, or over 10 miles round trip.

Registering for a Trip

You can sign up for trips on the Mountaineers' website. Anyone who is a no-show for two trips in a season will lose the registration privileges for snowshoe trips for the remainder of the season. If you were on a waiting list for a trip, it is your responsibility to check your email or to find out from the Seattle Mountaineers Program Center prior to the trip if you made it on. Some trip leaders may contact you as well.

Carpooling (to be used as a guide when COVID-19 Protocols permit car-pooling)

Transportation to and from field trips is the responsibility of the participant. Voluntary carpooling on trips is always encouraged by The Mountaineers, but for course field trips, due to limited parking availability carpooling is highly recommended.

The Mountaineers does not directly facilitate carpools but we provide you with a way to organize your own carpool. After you register for an activity, you will be taken to a confirmation page which indicates your Current Status as "Registered" for the activity. This page also includes a "Carpooling" section, which indicates your default carpool preference, as set in your Profile.

To change your carpool preference for a particular trip, click on the "Edit Carpool Preferences" button. A small window will appear with a drop-down list from which you can select either "None", "Drive", "Ride", or "Drive or Ride". This window also has a text box where you can provide notes about where you can meet, how many people you are willing to take if you can drive, etc. Your selections in this box will be visible in the Roster section of the trip listing.

In order to arrange a carpool, you can use the "Email Roster" button in the Roster to send a message to other willing carpool participants. (If you are the first person to sign up for the trip, there will be no other drivers or riders listed, so you may need to check back closer to the date of the trip.)

It is the responsibility of the drivers and riders to contact each other to make plans on meeting times and places.

Please note: If you have your membership profile set to "Private", then people will not be able to contact you to coordinate carpooling.

Reimbursement: The Mountaineers has not established a specific carpool mileage reimbursement rate. Again, this is all up to the people in the carpool.

Disclaimer: Carpools are set up as a convenience to our members but are not an undertaking of The Mountaineers. Drivers and riders participate in carpooling on a voluntary basis. The Mountaineers' makes no claim as to the worthiness of vehicles, ability of drivers, or appropriateness of riders. No liability will result to The Mountaineers from voluntary carpooling. Drivers must carry a valid driver's license and the state minimum required insurance.

For more information please see: www.mountaineers.org/explore/good-carpooling-practices

GEAR

What To Bring on a Field Trip or Snowshoe Trip

Snowshoes are required on all trips, although snow conditions may not necessitate their use. Gear is not available at the trailhead. You must arrange for your own rentals in advance of a trip. The Ten Essentials and wool or synthetic clothing are required on all trips. Drivers must carry chains and a snow shovel. A Gear List and a list of suggested snowshoe trips can be found near the end of this syllabus.

The Ten Essential System (Required for all Mountaineers trips)

Navigation: Area Map (waterproofed or in a plastic bag or case) & Compass with declination set for the area

Sun Protection: Sunglasses or goggles and sunscreen & lip screen

Insulation: Extra clothing (socks, sweater, mitts, long under-wear). See "Clothing" Below.

Illumination: Flashlight or headlamp, with extra batteries/bulb

Fire: Candle or other fire starter & Matches in waterproof container

Repair Kit and Tools: Pocketknife, Leatherman, wire, zip ties, duct tape around water bottle, etc.

Nutrition: Trip food (inc. mixture of carbohydrates, fats and protein) PLUS extra 2,000-4,000 calories for emergencies

Hydration: Extra Water. Always take at least 2 liters to drink.

Emergency Shelter: Examples are a bivy sack, tarp with poles, emergency blanket with poles, etc.

First Aid Kit: Can be homemade; it is not necessary to buy a commercially prepared kit, if you have supplies at home.

- 1" tape – large roll
- Ace Wrap
- Gel type dressing for blisters
- Gauze pads (clean bandana works great)
- Instant Hand Sanitizer
- Pencil and scratch paper (pens freeze)
- Pain meds; anti-inflammatory preferred
- Gloves (non-sterile)
- Moleskin
- Band-Aids (large type)
- Full-size SAM splint or other immobilizer (for sprains, broken bones, stabilizing neck injuries)

Snowshoeing Gear (worn or carried)

- Snowshoes, of course
- Ski poles or trekking poles with snow baskets. Collapsible trekking poles can be conveniently stored on your pack and give you a low profile for ducking through brush and trees when you are not using them. Snow baskets can be purchased at outdoor stores.
- Sturdy, lug-soled, waterproofed boots (see below)
- Clothing (no cotton) Inner Layer:
    - Wicking Liner socks, 2 pairs (one pair worn, other pair carried)
    - Synthetic Warm Underwear, top & bottom, 2 sets (one set worn, other set carried)
    - Liner gloves, (+ extra set in pack) Insulating Layer:
    - Outer socks, 2 pairs (one pair worn, other pair carried)
    - Pants, synthetic fleece or wool. Soft-shell or sturdy hiking pants suffice for many.
    - Shirt or sweater, synthetic fleece or wool
    - Mittens or gloves, 2 pairs (one pair worn, other pair carried) Protective Layer:
    - Rain parka with hood – waterproof & breathable preferred; remember, coated nylon doesn't breathe.
    - Rain pants – waterproof & breathable preferred
    - Long gaiters. Be sure they fit your boots correctly so that snow doesn't crawl underneath
    - Hats (one for warmth; one for sun protection)
    - Wind jacket. A fleece or wind stopper vest is also handy if it is warm
    - Scarf or neck gaiter if it is really cold

To keep items dry, put all extra clothing in a Ziploc bag or waterproof stuff sack in your pack.

Important Equipment NOT including the Ten Essentials:

- Foam sit pad
- Whistle
- Watch
- Toilet paper, sealable plastic bags, and hand sanitizer
- Snowshoe repair micro kit (wire, electrical tie wraps/zip ties, duct tape, snow baskets for poles)
- Pack (large enough for all winter gear)
- Straps or some other way to carry snowshoes on the pack
- Cash
- Cell phone

Additional Equipment You Might Want to Have:

- Hand and toe warmers
- Shovel – collapsible, metal preferred. (Your leader on trips will probably have one)
- Pack Cover
- Insulation for your water bottles
- Overmitts
- Lightweight mini-umbrella
- Dry clothes and shoes in your car for the trip home
- Sno-Park permit for the car if needed
- Garbage bags in your car for wet gear
- Camera and extra batteries
- GPS (in addition to, not in replacement of, map and compass)
- Altimeter and Flagging tape for navigation
- Binoculars

Tips on Selecting and Caring for Your Snowshoe Stuff

Consider renting different styles and brands of snowshoes before purchasing them. Get appropriately sized snowshoes for the Pacific Northwest snow. Metal frame snowshoes and full plastic models are used here. Most NW snowshoers use the 8"x24"size; heavier snowshoers use larger sizes while smaller snowshoers use 8”x22” ones. For most snowshoers, the energy required to lift a longer snowshoe is much greater than the minor improvement in flotation that the additional length provides. Whatever kind of snowshoes you select, be sure that the bindings on your snowshoes hinge up and down freely, yet allow little to no lateral movement of your boot. The binding should grip the boot firmly to keep it from shifting forward. Try them on with your boots BEFORE you get to the trailhead and make any fitting adjustments on the bindings.

Be sure your snowshoes have traction devices (a traction device under the heel and a crampon or claw under the ball of the foot). Traction devices must be effective in all directions so they will hold when going straight up or down the slope, traversing or angling uphill. If snow freezes to the metal claw, you can attach a piece of tough plastic, vinyl fabric or the universal fixer, duct tape, to the claw to reduce the tendency for the snow to stick.

Boots: Most snowshoers wear a heavy waterproof mountaineering boot, leather or plastic, with a hard toe so the binding does not constrict foot circulation. Snowmobile or rubber-type boots don’t work because the snowshoe binding cinches too tightly against your foot. Select a boot with a moderately stiff sole that you can walk in when not wearing your snowshoes. In the winter, a boot that is too tight will restrict circulation and produce cold feet.

Using Rental Equipment: Inspect your rental snowshoes for wear before walking away from the store with them. Look for frayed lacing or straps, for loose screws or bolts, and for pulled-out eyelets, hook, or rivets. Check the hinge mechanism to ensure that it pivots freely but does not wobble side-to-side.

SKILLS

Physical Conditioning

Your physical fitness prepares you to participate in mountaineering activities. It is up to you to be ready. Physical fatigue not only spoils the fun of an outing, but exhaustion or near-exhaustion can be dangerous. Tired people don't make good decisions, are more apt to become hypothermic, lose their physical coordination, and have more accidents. These activities are intended to be fun; it’s hard to have a good time when you’re tired. Get in shape and stay in shape to enjoy the activity of your choice. Remember, the sooner you start a conditioning program, the sooner you’ll be ready for the field trips and trips.

The best safeguard is good physical conditioning through any kind of regular (at least two to three times per week) exercise that puts a moderate strain on heart, lungs, and leg muscles for an extended (at least 30 minutes) period of time: jogging, stair climbing, swimming, bicycling, etc. The best choice, for those who have time, is hiking uphill with a moderate load in your pack and heavy boots on your feet, as it is the most specific equivalent for the activity you’ll be involved in on trips.

If you are in doubt about your condition, undertake a conditioning program now. If you suspect you have any serious physical limitation, see your doctor before starting any program. If you are unsure of your level of conditioning, find out now. If you are new to the outdoors, sign up for an easy hike or snowshoe and see how you do.

Staying Warm and Dry

To fully enjoy the winter environment, and to be comfortable and safe, you need to stay warm and dry. Being cold and wet is not only miserable, it is dangerous. Hypothermia, a condition in which your body's internal core temperature is low enough to cause illness, occurs without warning and quickly affects judgment and reasoning. Unless treated, hypothermia leads to apathy, collapse, and death.

Your body gains or conserves heat in four ways:

- Digestion of food produces heat to maintain normal body temperatures.
- External application of heat (sun, fire, and warmth from another body) warms your body.
- Muscular activity by deliberate exercise or involuntary shivering warms your body.
- Reduction of blood flow near the surface of your body constricts surface blood vessels, reducing circulation in your skin and keeping blood nearer your body's central core for use by your brain, heart and lungs.

Your body loses heats in four ways:

- Evaporation causes a large loss of thermal energy as water changes to vapor. Examples are perspiration from your skin and exhaling moisture from your lungs during breathing.
- Conduction transfers heat by direct contact. Contact with anything cooler than skin temperature contributes to heat loss. Examples are sitting on the snow, touching cold equipment and being rained on.
- Radiation is the emission of thermal energy and causes the greatest heat loss from uncovered surfaces of your body. Your head and neck, areas where large blood vessels come close to the surface of your body, are particularly susceptible to radiation heat loss. Your unprotected head may lose up to 50% of your body's total heat production at 40°F.
- Convection facilitates heat loss by movement of air or fluid. Your body continually warms a thin layer of air next to your skin. If this warm air stays close, it insulates you; but if air currents remove warm air, your body cools at a much more rapid pace. This is why wind can chill you so quickly.

Snowshoeing is one of the more strenuous exercises you can engage in the mountains, particularly when you are on the front breaking trail. Your clothing can become saturated with moisture from profuse sweating, even in winter. You will chill down very quickly as soon as you stop for a break or move to the back of the group so you need to learn how to stay dry and warm without overheating. Avoid excessive sweating by adjusting the amount of clothing you are wearing frequently and by adjusting the pace as necessary.

You can combat heat loss through radiation by remembering to put on a hat (it applies equally to the rest of your body) It's much easier to put on a hat than to add another layer of clothing. Keeping your neck warm by putting on a fleece neck gaiter or putting on your jacket hood is also very helpful. Conduction occurs when you sit on cold surfaces during rest breaks. Use an insulating foam sit pad during breaks or sit on your pack to avoid direct contact with cold snow, rocks or tree stumps. Winter campers often find that it helps to put a foam pad under their feet as well.

Layer Your Clothes to Stay Warm and Dry

Layering fights convection and evaporation. In the Northwest you will need at least three layers for winter activities: a wicking layer, an insulating layer and a layer for wind and rain protection.

Wicking Layer: You will work up a sweat when you snowshoe, and as evaporation removes the sweat, your body cools. For this reason, synthetic materials, such as polypropylene, polyester or acrylic, will wick away sweat from your body; so will silk and wool. Do not wear any cotton during winter activities. Once cotton is wet, it is worthless as an insulating layer and will actually cool your body faster. The wicking layer for snowshoeing is usually long underwear (tops and bottoms) made of synthetic material, wool or silk. Long underwear is available in a variety of weights, but lighter

weights are usually preferable for aerobic activities like snowshoeing. Bring an extra underwear top to put on if one gets wet.

Insulating Layer: This can be a single heavier layer or several light layers. Wool or synthetic materials (i.e., fleece or pile) work best for our damp climate. If they get wet, you can just shake them out, they will still insulate you, and they dry very quickly. Down is generally a poor choice for snowshoeing in the Pacific Northwest environment because it is nearly impossible to keep a down garment dry while snowshoeing. When down gets wet, it is useless as an insulating layer. However, some people like to put on a down vest or jacket when they stop for breaks or make camp. If you can keep a down garment dry under your rain protection, it can't be beat for compressibility, lightness and warmth.

Protection Layer: This has dual purposes: defending from wind, and defending from rain and snow.
Wind Protection – The stronger the wind, the more heat you will lose through convection. In keeping warm, wind protection is as important as adequate insulation. When it is windy, wear a wind-resistant jacket and pants. Cover your head with a hat or hood. Often, a thin wind-resistant layer will maintain warmth more effectively than a thicker layer that the wind penetrates.

Rain/Snow Protection- Wet clothing is dangerous; it can extract heat from your body 24 times as fast as dry clothing. When it is raining or snowing, wear a densely woven waterproof nylon jacket and pants. Coated nylon works well but tends to trap your body's moisture, causing underlying layers to become damp. Breathable waterproof fabrics, such as Gore-Tex, are more effective, but they are more expensive. Consider using an umbrella; it will keep you dry.

Don't forget your head, feet and hands. Your extremities must be protected if you are to stay comfortable, dry, and warm. You're very likely to soak at least one pair of gloves on a snowshoe trip so bring at least one extra pair of gloves or mittens. Bring extra socks and hats as well.

Bring Adequate Layers of Emergency Clothing

In a bivouac situation, you must remain warm enough to survive without danger of frostbite or hypothermia and, preferably, you should also be warm enough to be able to sleep. You must bring enough layering and insulating clothing to remain warm during low levels of activity, and you must remain dry because wet garments conduct your body heat away from you into the cold air or cold ground next to you. Your clothing, socks, and boots will likely get wet during snowshoeing from snow, rain, and perspiration. Extra dry clothing plus an insulated or closed-cell foam pad in your pack is important for survival.

The first principle of survival is to avoid situations in which the survival issue arises. Physical conditioning, trip planning, route finding, navigation, competent leadership, and adequate equipment all can help you to avoid ending up in a survival situation.

Eating and Drinking To Help Keep Warm

Since you will sweat while snowshoeing, you must drink fluids to avoid dehydration. Plan on at least two quarts of water for an all-day outing. Don't drink a lot at any one time. Instead, drink a little, but drink often even if you don't feel thirsty. Cold decreases your thirst even as your need for water increases.

Your body burns fuel to stay warm and to work your muscles. You can use up to 6,000 calories on a one-day outing. You must replace these calories to stay warm and keep going. Snack often, primarily on easily digestible high-calorie carbohydrates. Pack foods that you know you will eat.

All this exercise produces fatigue by-products, such as lactic acid, that must be dissipated by rest. Keep a slow, steady pace and rest about 5-10 minutes every hour. A longer rest is of little additional value: in the first 5-7 minutes of rest, you get rid of about 30% of the lactic acid buildup, but in the next 15 minutes you get rid of only about 5% more. Only sleep does a thorough job of eliminating these by-products.

Snowshoe Travel

Basic snowshoe technique on flat terrain is not much more difficult than walking, once you get used to having feet that are 8 inches wide and 24 inches long. On steeper terrain, there are a few techniques that you should practice to travel successfully.

The first step is getting them on. Some snowshoes have no left or right shoe, but many do. Step into the snowshoe and align the ball of your foot with the axle of the traction device. Follow the manufacturer's instructions for putting on your snowshoes. Be sure to get the excess strapping out of your way so you won't trip on it. Now you're ready to venture forth. You'll find that a rolling gait with the tips of the shoes lifted slightly upward with each step is the easiest way to walk. You may need a slightly wider stance to walk without stepping on the other snowshoe, but you'll probably find this comes without much effort.

Since Northwest snow conditions vary widely - sometimes from step to step, the snowshoer must work to maintain good balance with the weight centered over each foot. A sliding stride sometimes helps, but try to keep your weight centered. On hard or icy surfaces, you'll have to plant each foot firmly to help set the traction device of the snowshoe. A step with good traction involves a deliberate, firm step and waiting a second or two for the snow to grip the crampons under the snowshoes before taking the next step.

Falling (Correctly) - Practicing in soft snow on the flat is an easy way to banish the fear of falling. This will benefit confidence in handling hills. Falling can happen quite often in snowshoeing depending on terrain and conditions. If you don't get comfortable falling, your confidence will suffer in steeper terrain.

To fall to the front, bend at the waist and knees while crossing arms in front to cushion the fall. The forearms are used in the fall to push the snow out away from you. This eases the fall and catches weight gradually.

To fall to the rear, ball up into a crouch so that you will roll as you contact the snow. To practice this, crouch down with hands near the knees and roll backwards.

Getting up is easier with poles. The first task is to roll over on your front if you are not already in that position. Place the poles crosswise on the snow and use them to raise the upper body. From that position, place one pole and then the other, basket down, to support standing up.

Turning - Changing directions on the switchbacks requires a turning technique. Swing your downhill foot perpendicular and ahead of your uphill foot. Pivot your body weight onto your front foot and bring your other foot around. You are now ready to begin going the other way! If the terrain allows, the turn can be wider (with more steps involved) or tighter (by doing a 180-degree kick step turn).

Uphill Travel - On gentle uphill slopes, you can climb straight uphill. Stay an adequate distance from the person in front of you to keep from getting a face full of snow or a facial restructuring from the snowshoe above. As the hill gets steeper, other techniques need to be used.

Step Kicking - Steeper snow calls for step-kicking if the snow is deep enough. Kick steps by pointing your uphill toe down and in firmly, then flattening your foot to compact the snow under the foot. The next foot repeats the process, creating a set of steps that the next person follows, deepening and improving the step.

Traversing - Another technique for traveling uphill is to traverse the slope. The leader makes switchbacks across the slope by firmly placing the uphill snowshoe while pushing the uphill edge into the slope and keeping the platform as flat as possible. Keeping centered on the snowshoes and staying in balance, followers improve the steps of the leader with a similar technique.

Rest Step - The rest step is an essential uphill technique for delaying the onset of fatigue on long strenuous trips. Stamp the forward foot into the snow, straighten the rear leg, lock the knee, pause, breathe deeply, relax the thigh, and then repeat with the other leg.

Breaking Trail - The first person in the party has the task of finding the route and setting steps in the snow, often a tiring activity if the snow is heavy or deep. Each person in the party should take a turn as leader for a set amount of time or number of steps; he/she then steps to the side, lets the party pass, and takes up position at the end of the line. This conserves the strength of the party and allows everyone the fun of route finding.

In deep snow, with a large party, sharing the leadership can make the difference between getting to your goal and having to turn back early, before it gets dark. The second person in line always should improve the leader's steps; and each other party member should do the same in turn. If you should break out a step, trail etiquette calls for you to kick a new step for the people following you.

Downhill Travel - Going downhill is more difficult than one might suppose, especially with snowshoes without aggressive and multi-directional crampons. The best rule of thumb is to take small enough steps to keep your weight centered on the snowshoes. *Do not lean backward,* as that actually will tend to push your feet out from under you. A quick shuffling step will keep your weight centered and will decrease the chance of slipping. Fresh snow often is easier to descend than using someone else's footsteps, as it provides more traction.

Traversing down the slope can be a good choice as slopes get steeper. Another option is plunge stepping (see below). Downhill technique in snowshoes often provides a new set of challenges on a trip. As with other winter travel, be aware of what is above you and what the run out is like, adapting the technique to fit your ability and the terrain.

Plunge Stepping - Plunge stepping is one technique to use in downhill travel when the snow is relatively soft. Take long steps with the knee initially stiff, heel down; then, as the heel strikes, relax the knee, keeping the toe turned up. A bouncing or slightly jumping step can help.

SAFETY

Hazards of the Winter Environment

Most people snowshoe because they enjoy the beauty and serenity of the mountains in winter, but this environment can also be hazardous. To cope with the hazards, you must know what this winter environment is like and how you body responds to it. Typically, the environment is cold, wet, and windy. Travel in deep snow is often slow and strenuous. Trails that can easily be followed in the summer are obliterated. Winter days are shorter than summer days. All of these factors can make it easy to become exhausted, lost or caught by darkness in the mountains.

Check the Weather

Before setting out on a snowshoeing trip, try to collect as much information about the weather as possible. NOAA's website is an excellent weather resource: www.wrh.noaa.gov/sew/. Take advantage of the pinpoint forecasts, different radar, and satellite imagery available on the left-hand column and to pinpoint your hiking location.

Remember that weather predictions are never completely reliable. Be prepared for the worst weather.

Watching the clouds and noting the direction of the wind can provide useful indications of what the weather is doing. In western Washington, winds from the south or southwest usually indicate deteriorating weather; winds from the north usually indicate fair weather. Remember that valley and mountain winds and clouds can be local phenomena. It is the higher winds that count; note the direction of the highest clouds that you can see. Weather can change rapidly in Washington.

Weather systems can move through the mountains within hours. At one place in the mountains it may be 15°F, clear and still at 8:00 AM and then 40°F with heavy rain and high winds by 2:00 PM.

The Internet, newspaper weather maps, radio, smartphone apps, and TV reports all are useful. You should check these resources for the latest information. They are listed on page 19 of this course guide.

Incident Response

If a stressful incident occurs, the "7 steps of Incident Response" provides a ready framework to handle the situation. In urban environments, the plan will most likely involve calling 911. In the woods and mountains, the situation will be more difficult. The more people are on the trip, the better the incident can be handled. Mountaineering first aid is not required for people in the Basic Snowshoeing course, but you should keep in mind the "7 Steps" of incident response:

The Seven Steps of Incident Response

1. Take charge of the situation
2. Guard against another incident
3. Render life saving measures if required
4. Protect from cold
5. Establish extent of problem or injury
6. Make a plan
7. Carry out the plan

Hypothermia

Although not a condition of cold weather alone, hypothermia is a continuous threat to snowshoers. You need to know how to recognize, prevent and treat this illness. If your body loses more heat than it gains, your body core temperature will decrease progressively until hypothermia results. Exposure to cold constricts the blood vessels in your skin and then to the deeper lying tissues. The effect is the amount of heat transported by your blood to your skin decreases so your skin temperature lowers.

Preventing Hypothermia

<u>Prevent Heat Loss</u>

- Control evaporative heat loss by regulating clothing to prevent excessive sweating.
- Cover your head, neck, and hands. Put on a hat.
- Wear layers of clothing that help maintain a layer of warm air next to your body.
- Use insulation between your body and cold objects. Wear a pile or fleece. Wear a wind or rain jacket and pants in windy or wet weather.
- Exchange wet clothes for dry ones.
- Don't wear cotton. Use a sit pad during rest breaks.
- Wear clothes that insulate when wet or that wick wetness away from the body.
- Cover your mouth and nose with wool or insulating material.

<u>Generate Heat</u>

- Drink water and eat food high in carbohydrates, fats, and sugars. · Keep continuously active to ensure adequate heat production.

Terminate Exposure

- Get out of the wind, rain, and snow. Find shelter. Bivouac early before your energy is exhausted and your coordination and judgment are impaired.
- Put on your wind and rain clothing.
- Use your emergency blanket for shelter or an additional clothing layer.

Detect Hypothermia Early

Anytime you are exposed to wind, cold or wetness, **watch each individual for the signs and symptoms of hypothermia**.

Treatment of early hypothermia is relatively simple compared to the efforts needed to deal with a severely ill individual. *The individual may deny having any problems*. **Believe the signs and symptoms, not the victim.**

Signs of Hypothermia

Mild Hypothermia

- Complaints of Cold
- Shivering
- Difficulty using hands
- Core temperature above 90° F (32° C)
- Psychological changes, withdrawal, and apathy

Moderate to Severe Hypothermia

- Lethargy, mental confusion
- Refusal to recognize the problem
- Uncontrollable shivering
- Slurred speech and/or stumbling
- Core temperature 90° F (32° C) or lower

First Aid

- Get the patient out of the cold and wet. Insulate them from the cold ground.
- Replace wet clothes with dry; add insulation to clothing
- Place the patient in a warm, dry environment. If this is not possible, patients can be rewarmed by another body in close contact. Hot water bottles and chemical hand warmers are also very effective.
- Offer warm liquids or food if the patient is conscious and able to swallow easily. Rehydration is dramatically effective in treating mild hypothermia. Dehydration is a strong contributing cause of hypothermia.

Treatment of the very cold individual with severe hypothermia is beyond this course. Consider taking a mountaineering first aid course.

Frostbite

Frostbite is caused by constriction of surface blood vessels in conjunction with exposure to cold. Your hands and feet are affected most commonly, but your nose, ears, and face are also particularly susceptible when it is cold. If the temperature continues to drop, circulation will almost completely cease in the affected area and frostbite will occur.

Preventing Frostbite

- Wear enough clothing and protect skin from strong, cold winds. Don't wear constricting clothing or boots.
- Exercise fingers and toes to maintain adequate circulation.
- Don't touch cold metals or cold gasoline with bare skin.

Signs of Frostbite and Giving First Aid

Superficial Frostbite: Skin is pale and cold. Treat by rewarming.

Deep Frostbite: Skin is pale, dull or waxy. Treatment: treat for hypothermia first. Keep part frozen until rewarming is possible in a hospital.

Avalanche Awareness and Avoidance

Northwest Avalanche Center forecasts

The Northwest Avalanche Center issues forecasts and information on a daily basis from about mid-November to mid-April, providing backcountry travelers current information on snow-pack structure and avalanche hazard. The forecast region includes all snow covered terrain within the Olympics and Cascades of Washington and Northern Oregon at elevations below 7,000 ft. For more information, go to the web address www.nwac.us for current avalanche conditions. You can also telephone 206-526-6677 for a recorded report.

1 - Low (Green)

Travel Advice: Generally safe avalanche conditions. Watch for unstable snow on isolated terrain features.

Likelihood: Natural and human-triggered avalanches unlikely.

2- Moderate (Yellow)

Travel Advice: Heightened avalanche conditions on specific terrain features. Evaluate snow and terrain carefully; identify features of concern.

Likelihood: Natural avalanches unlikely; human-triggered avalanches possible.

3 – Considerable (Orange)

Travel Advice: Dangerous avalanche conditions. Careful snowpack evaluation, cautious route-finding and conservative decision-making essential.

Likelihood: Natural avalanches possible; human-triggered avalanches likely.

4 - High (Red)

Travel Advice: Very dangerous avalanche conditions. Travel in avalanche terrain not recommended

Likelihood: Natural avalanches likely; human-triggered avalanches very likely.

5 - Extreme (Black)

Travel Advice: Avoid all avalanche terrain.

Likelihood: Natural and human-triggered avalanches certain.

A few Beginner and Basic trips may be passing through terrain with minimal avalanche hazard. If your trip is headed for an area with significant avalanche danger, go elsewhere. Guidebooks will have advice on the location of avalanche prone areas.

Avalanche awareness and rescue requires training far beyond the scope of this course. All adventurers spending time in the mountains when there is snow around or above them should take an AAIRE Avalanche Level I Safety course. The Mountaineers offers this course through a number of its branches during the winter. The course is also available through many vendors outside of the organization.

Winter Driving Techniques

Not all of the winter skills you'll use involve snowshoes. Just to get to the trailhead you may need to know how to drive on snow and ice on mountain roads. Sooner or later, whether it's on a Mountaineers trip or a trip of your own, you're likely to encounter snowy roads. Since Puget Sound's rare snowfalls don't give a driver much of a chance to practice, it may help to read about some basic techniques for winter driving before you find yourself on that patch of ice on I-90. Although the Washington highways are repeatedly dozed/sanded/salted, a few situations warrant special attention. Changing lanes should be done carefully on snowy roads because you may have to cross snowy patches to get into the next lane. Always reduce speed when approaching a curve or turn in the road. Of course, be sure to use your signals.

Getting There and Home Safely

Oftentimes you'll encounter different road conditions on the way back home, when you're tired. Warming temperatures or even the heat generated by traffic tires can cause water to sit on top of compact snow. This can be very slippery. Melting can occur on the road during the day then refreeze the moment the sun goes down. Black ice can look just like a bare road surface but is extremely treacherous. It can occur at altitudes and temperatures where the snow has turned to freezing rain or drizzle - or any place where meltwater has frozen on the road surface. Remember that ice at 32°F is twice as slick as ice at 0°F. Be alert and be prepared for sudden changes in road conditions.

Vehicle Preparations and Helpful Hints

Make sure your car is in good working order. In particular, check all fluid levels, tire condition and tire pressure. All-season or Mud/Snow/All-Weather tires are generally preferable. Tread depth should be at least one-eighth inch for it to grip in the snow. You should also have chains along on your travels. Wiper blades should be in good condition, and should be set upright and away the windshield when parked in freezing or potentially freezing weather.

Spraying a shot of dry lubricant into door latches will help keep them from freezing up. You may wish not to set your parking brake when you leave your car or it may freeze solid while you are gone. Keeping a lighter or match with you (not in the car) can be helpful when you get back to the car. If the lock does freeze, try heating the key before inserting it into the lock. The key should warm up the lock enough for it to work again.

Chaining Up

You may be required to put chains on your tires at the mountain passes and above Longmire at Mt. Rainier. Four-wheel drive vehicles may proceed without chains when chains are required, but they still must have a set of chains inside the vehicle, available to put on. Chains not only provide better traction when climbing hills, they also help provide the necessary drag for better control when descending hills. All chains come with instructions. Read them ahead of time, practice putting the chains on your tires and be sure to keep the instructions with the chains in the car. Be sure to put the chains on the tires for your drive axle. On a front-wheel drive car, that would be the front wheels and on a rear-wheel drive car that would be the rear wheels. Having a pair of pliers and a screwdriver is also handy to accompany your traction devices.

Driving

Drive slowly and take your time. Patience pays off in safety. Don't follow too closely and resist the urge to travel too fast while in snowy/icy conditions. It takes much longer to stop your vehicle while driving on snow and ice. Accelerate and brake gently. Avoid accelerating and braking while on ice – if at all possible utilize bare patches to assist you in keeping your vehicle under control. Bare patches in the road allow the tires a place to grip but remember they may be covered with a layer of ice. Roadside reflectors can assist you in identification of the edge of the road. Always travel with your headlights on and on low beam.

Getting Stuck

If your car does get stuck in the snow and help is not within certain reach, it is usually safer to stay in your car until help arrives or until the weather changes than to wander out in the environment. Use some of the emergency items listed

in the following checklist to keep you comfortable. If you run your engine for the heater, do so only for a few minutes at a time, saving on gas and being sure to ventilate the car.

Parking

Keep in mind that many winter parking areas require a Sno-Park permit (available at most outdoor stores). Be sure that you have parked in a legal area as designated in the Sno-Park brochure. Recreational parking is not allowed on highways, off-ramps, interchanges, or under overpasses. If possible, park your car facing downhill, and back into your parking place. If your battery should die, it will be much easier to jumpstart if the engine is accessible to the rescue vehicle. It is easier to get out of a parking place if you can put your car in Drive rather than in Reverse. Select a parking place where others are not likely to slide into it.

Equipment Checklist for Winter Driving

- Spare tire, in good condition and properly inflated
- Lug wrench & Jack
- Tire chains or cables (Practice beforehand, and make sure they fit. There may be times when AWDs do require tire chains per WSDOT advisory)
- Stout wire and pliers (for repairing chains)
- Shovel
- Spare keys for car
- Windshield scraper
- Jumper cables
- Many of the Ten Essentials: First Aid kit, flashlight with spare batteries and bulb, extra shoes or boots & clothes, extra food and water, blankets or sleeping bag
- Extra money to pay for telephone or emergency expenses
- Coffee can filled with sand/clean cat litter, old rug, board or wire mesh screen to provide traction

ADDITIONAL INFORMATION

Where to Find Gear

Snowshoe rentals are available as follows:

1. REI Seattle, 222 Yale. 206 223-1944
2. Ascent Outdoors, 5209 Ballard Ave. NW, 206-734-4447
3. Outdoor Research Retail Store, 2203 1st Avenue South, 206-971-1496
4. REI Lynnwood, 184th Street SW, 360-640-6200
5. REI Tacoma, 3825 South Steele Street, 360-671-1938
6. Whittaker's Summit Haus, Ashford, 1-800-238-5756
7. Backpacker's Supply, 5206 South Tacoma Way, 360 472-4402
8. Miyar Adventures, 17311 135th Ave NE, Ste. #C-500, Woodinville,(425)949-8634

Rentals can also be purchased at a discount after Presidents Day at various outfitters.

Inexpensive or used clothing and/or equipment can be found at physical retail stores, such as:

- Consignment Shops and Thrift stores
- Value Village – Several around town
- Goodwill -- Several
- Children's Hospital thrift stores – several
- Ascent Outdoors (formerly Second Ascent) in Ballard – Has used and new gear; snowshoes also.
- Play It Again Sports – check their website for locations
- Outdoor Research store – SODO – sale items
- Great Outdoors Clothing Company (North Bend outlet)
- REI Garage Sales

They can also be found at online retail and gear exchange websites:

- www.sierratradingpost.com – Online and catalogue
- www.campmor.com – Online and catalogue
- www.backcountry.com
- www.steepandcheap.com
- www.rei.com/outlet
- www.geartrade.com
- www.backcountrygear.com
- Craigslist
- Ebay
- Freecycle

Important Websites and Phone Numbers

Web Sites:

The Seattle Mountaineers	206-521-6000	www.mountaineers.org
The U.S. National Weather Service	206-526-6087	www.weather.gov
Northwest Avalanche Center	206-526-6677	www.nwac.us
National Weather Service Forecast Office in Seattle		www.wrh.noaa.gov/sew/
Washington State DOT		www.wsdot.wa.gov/traffic/

Smartphone Apps:
Avalanche Forecast (website only, currently)
AccuWeather (for iPhone, iPad and Android platforms)
WSDOT App (iPhone, Android platforms)

Phone Numbers:

Backcountry Information / Permits

Mount Rainier National Park	360-569-2211
Olympic National Parks	360-452-4501
Washington State Parks Info	800-233-0321
North Bend Ranger Station	425-888-1421
Mt Baker Ranger Station	360-856-5700
North Cascades National Parks	360-856-5700
Skykomish Ranger Station	360-677-2414

Alpine Snow Phones

Snoqualmie Pass	206-236-1600
Stevens Pass	206-634-1645
Mt Baker	360-671-0211

Road Conditions

Seattle Times Info line	206-464-2000 x9900
National Weather Service	206-526-6087
NW Pass & Highway (AAA)	425-646-2190; 206-646-2190
Washington DOT	206-368-HIWY