

# **SNOWSHOE WINTER CAMPING**

## **Course Syllabus**



**THE MOUNTAINEERS SEATTLE BRANCH SNOWSHOEING  
COMMITTEE**



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## INTRODUCTION

Welcome to the Seattle Mountaineers' Winter Camping Course. Our goal is to show you what a warm and pleasant experience winter camping can be!

You will set up a tent in the snow and optionally build a personal snow cave. Snow is a great construction medium. It provides almost unlimited opportunities for creativity.

This syllabus is a guide to the Winter Camping Course and a supplement to the primary texts. You'll find handy checklists and other helpful information. The appendices also contain a bibliography, an application for graduation and a course evaluation sheet for providing comments to the Snowshoe Committee on how you liked the course and any suggestions for improving it.

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

## CONTACTS

Most of your questions about the course should be answered at the lectures and field trips or in the course texts and this syllabus. Should you have any policy or procedural questions, comments or concerns, please address them to Tim Lawson who is your primary point of contact.

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Website: We also have a Mountaineers Snowshoe web site, where you'll find current information on tours, courses and links to other useful sites: <https://www.mountaineers.org/about/branches-committees/seattle-branch/committees/seattle-snowshoeing-committee>



## COURSE SCHEDULE

The course schedule can be found on the [Mountaineers website](#). The course includes an in-person lecture intended to explain key winter camping principles and concepts and supplement the reading materials. There is also one checkin online meeting to provide specific information on the upcoming field trip, answer questions and clarify policies and procedures. The overnight winter camping field trip is where the winter camping skills are practiced, hands-on.

### Course Field Trip

The field trip is your opportunity to practice the techniques presented in the lecture and reading assignments under the guidance of experienced instructors.

Your performance on the field trip will be evaluated and discussed with you by your instructors. For your reference, a sample field trip report card is included as Appendix 2 to this syllabus. 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 assignments and handouts.
- Be prepared for two full, long days 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.



## Highly Recommended Texts

Books can be purchased online at the Mountaineers:

<https://www.mountaineers.org/mountaineers-books>

- Mountaineering: The Freedom of the Hills, (9<sup>th</sup> ed.) 2017 (hereafter, "Freedom")
- Wilderness Navigation: Finding Your Way Using Map, Compass, Altimeter & GPS, (3<sup>rd</sup> ed.) Bob Burns and Mike Burns, 2015
- Mountaineering First Aid: A Guide to Accident Response and First Aid Care, (5<sup>th</sup> ed.) Jan Carline, Martha Lentz and Stephen Macdonald, 2004
- Avalanche Essentials, (2<sup>nd</sup> ed.) Bruce Tremper, 2013
- Snow Sense: A Guide to Evaluating Snow Avalanche Hazard, (5<sup>th</sup> ed.) Jill A. Fredston, Doug Fesler and Douglas S. Fesler, 2011
- The Avalanche Handbook, (4<sup>th</sup> ed.) David McClung and Peter Schaerer, 2023
- Conditioning for Outdoor Fitness: A Comprehensive Training Guide, (2<sup>nd</sup> ed.) David Musnick, Mark Pierce, Sandy Elliott, Mark Pierce, 2004
- Snowshoeing: From Novice to Master, (5<sup>th</sup> ed.) Gene Prater, 2002
- Northwest Mountain Weather: Backcountry Forecasting for the Hikers, Campers, Climbers, Skiers, Snowboarders. Jeff Renner, 2005.

Recommendations for additional reading are included in Appendix 4 to this syllabus.

This and other texts are available at the Mountaineers' Bookstore (remember your 20% member discount).

## READING ASSIGNMENTS

All Syllabus sections

Freedom:

Chapter 2, Clothing and Equipment

Chapter 3, Camping and Food, section "Snow and Winter Camping"

## GRADUATION REQUIREMENTS

Complete the following requirements

Lecture: Attend the lecture in person

Field Trip Preview: Attend on line.

Field Trip: Successfully participate in both days of the instructional field trip.

Application: Submit a graduation application (the application form is included as Appendix 5 to this syllabus)

## 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. People who are out of shape are a liability to themselves and their entire party. Tired people don't make good decisions, are more apt to become hypothermic, lose their physical coordination and have more accidents. A number of snowshoeing trips, hikes, scrambles and climbs



are aborted each season because someone in the group was out of shape. Don't spoil someone else's outing by signing up for an activity beyond your physical ability. 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 tours. It's your responsibility to be in condition.

The best safeguard is good physical conditioning through any kind of regular (at least three times per week) exercise that puts a moderate strain on heart, lungs and leg muscles for an extended period of time (at least 30 minutes): jogging, stair climbing, swimming, bicycling, etc. The best choice, for those who have time, is hiking uphill with a heavy 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 outings.

If you are in doubt about your condition, undertake a conditioning program now. You may want to start by consulting a good book on the subject (for recommendations see the list of references, included as Appendix 4 to this syllabus). 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 and see how you do. If you do well, sign up for a moderate hike next time. If you do well on a moderate hike, sign up for a more strenuous hike.

You must be fit for the more physically demanding courses like Snowshoeing, Alpine Scrambling or Basic Climbing. Try hiking up Mt. Si (8 miles round-trip; 3550 ft. elevation gain) and see how you do. If you can get to the top of Mt. Si (to the view points in the haystack basin) in 2½ hours or less (barring icy conditions), you are probably in adequate condition for this course. If it takes you longer, you need to start a conditioning program today. Remember, the last person on the outing should be the last because they have volunteered or have been asked to be rear guard, not because they can't keep up with the group.

## CLOTHING AND EQUIPMENT FOR SNOWSHOEING

You are responsible for providing your own equipment. You may already own some of the needed clothing and hiking-related items. Many items (e.g., snowshoes, ice axe, pack, avalanche beacon) can be rented. Our equipment recommendations are generally conservative, based on the need to be fully prepared for severe weather, emergencies or accidents. Required equipment for snowshoe tours varies with the type, length and destination of the tour.

### Clothes for Winter Travel

- 2 sets synthetic long underwear tops and bottoms \*
- 2 pairs wicking liner socks \*
- 2 pairs liner gloves \*
- Shirt or sweater (synthetic fleece or wool)
- Pants (synthetic fleece or wool)
- 2 pairs outer socks \*
- 2 pairs mittens or gloves \*
- Breathable rain parka with hood (Gore-Tex or equivalent suggested)
- Breathable rain pants (full-length side zippers suggested)
- 2 hats (one can be a balaclava) \*
- Long gaiters (be sure they fit your boots correctly, so snow doesn't crawl underneath)
- Over-mittens

\* Wear one (set) and carry the other in your pack in a zip-top bag or waterproof stuff sack so they'll stay dry.

**Remember: NO COTTON**

### Additional Clothing You May Want to Have (optional)

- Neck gaiter, if the weather is really cold
- Synthetic shorts to wear over your long underwear



- Headband, if the weather is warm
- Fleece or wind-stopper vest, if the weather is warm

## Equipment for Day Trips

- 10 essentials  
(online information can be found here: [10 essentials](#))
  - map of the area (waterproofed or in a plastic case)
  - compass with declination set for the area
  - flashlight or headlamp, with extra batteries and a spare bulb
  - sunglasses or goggles and sunscreen
  - first aid kit
  - pocket knife
  - matches in waterproof container
  - candle or other fire starter
  - extra clothing (socks, sweater, mitts, long underwear, etc.)
  - extra food (to be used in case of emergency)
- Snowshoes
- Heavy lug-soled hiking boots - warm boots! \* break them in first!
- Pack
- Shovel (collapsible metal, NO plastic)
- Trekking poles with snow baskets
- Lunch
- 2 one-liter poly water bottles (or one bottle and one thermos)
- Closed-cell foam sit pad (torso length recommended) optional
- Whistle
- Watch
- Emergency shelter (such as plastic tube tent, about \$3, or a bivy bag, more \$)
- Emergency blanket (the substantial kind, for example with red on one side and silver on the other side)
- Toilet paper and at least 2 plastic bags for human waste
- Snowshoe repair kit
  - Duct tape
  - 6 to 10 tie wraps (self-locking cord ties)
  - 5 feet galvanized steel or aluminum mechanic's wire without cover
  - multi-purpose tool (or separate pliers, screwdriver and awl)
  - lightweight wrench that fits the bolts on your equipment
  - 10 feet parachute or utility cord (~2mm)
- SNOPARK permit for your car, if required and you drive to the trailhead
- Dry clothes to leave in the car and wear for the car trip home
- Garbage bags for wet gear

## Additional Equipment You May Want to Have (optional)

|                           |                                     |                              |
|---------------------------|-------------------------------------|------------------------------|
| Flagging tape             | Camera (and film/memory card)       |                              |
| Umbrella                  | Avalanche probe                     | Binoculars                   |
| Avalanche beacon          | Altimeter                           | Pack cover * in case of snow |
| Hand and Foot Warmers     | Wands                               | Ice Axe                      |
| Straps to carry snowshoes | Foam cover to insulate water bottle |                              |

## First Aid Kit

| Item                    | Amount | Use          |
|-------------------------|--------|--------------|
| Band-aids (1 in. width) | 6      | Minor wounds |



|                                               |            |                           |
|-----------------------------------------------|------------|---------------------------|
| Butterfly bandages                            | 3          | Minor lacerations         |
| Sterile gauze pads (4 in. x 4 in.)            | 4          | Larger wounds             |
| Carlisle "battle dressing" or sanitary napkin | 1          | Severe bleeding           |
| Non-adhesive dressing (4 in. x 4 in.)         | 2          | Abrasions, burns          |
| Self-adhesive roller gauze (2 in. width)      | 5 yards    | Holding dressing in place |
| Athletic tape (2 in. width)                   | 1 roll     | Multi use                 |
| Triangular bandage                            | 2          | Sling, cravat             |
| Moleskin, mole-foam                           | 4 to 6 in. | Blisters                  |
| Betadyne swabs                                | 2 pkg.     | Antiseptic                |
| Alcohol swabs                                 | 3          | Cleanse skin              |
| Thermometer (30 to 41°C or 90 to 100°F)       | 1          | Estimate body temperature |
| Sugar packets                                 | 4          | Diabetes (insulin shock)  |
| Acetaminophen (325 mg tablets)                | 6          | Headache, pain            |
| Elastic bandage                               | 1          | Sprain                    |
| Safety pins (large)                           | 2          | Multiple use              |

#### Additional helpful items

- Tweezers and steel sewing needle for splinter removal
- Scissors or single-edge razor blade
- SAM splint or wire splint
- Wooden tongue depressor or aluminum finger splint
- Coins for telephone call
- Small roll of duct tape (can wrap around eraser end of a pencil)
- First aid reporting form and pencil

## **CLOTHING AND EQUIPMENT FOR WINTER CAMPING**

For a winter camping trip, you will need clothing and equipment in addition to what you would take for a regular day snowshoeing trip.

### **Additional Clothing**

- Dry long underwear top and bottoms, to sleep in
- Dry socks, to sleep in

### **Additional Equipment**

- Sturdy, all-season tent, with rain fly
- Closed-cell foam pad or Therm-A-Rest, full length (many people bring two for sleeping on snow)
- Warm sleeping bag
- Stove and stove platform
- Stove fuel
- Large pot to melt snow in
- Cup and spoon
- Plenty of high fat-content food you like and will eat

### **Additional Equipment You May Want to Have (optional)**

|                    |                                                     |
|--------------------|-----------------------------------------------------|
| Sleeping bag liner | Small whisk broom (to sweep snow out of the tent)   |
| Bivy bag           | Rubber gloves (to smooth the inside of a snow cave) |





Snow saw

## WINTER CAMPING AND SURVIVAL

Winter camping and survival require a further refinement in skills and preparation as compared with camping during other times of the year. In winter camping or survival situations, you must be prepared to endure severe weather and be prepared to stay out overnight. You may have planned such an overnight trip intentionally or you may be forced to stay out overnight due to the weather or due to the need to help an injured/ill party member. You should have the equipment and skills to survive an overnight stay in severe weather. Remember that a temperate, sunny (okay, drizzly) winter day in Seattle offers no assurance of pleasant overnight weather up in the mountains.

Freedom includes a good introduction to snow camping, covering the construction of snow caves and igloos.

Freedom also provides good information on emergency snow shelters (for the unplanned case). 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. Then, an unplanned night in the cold may be necessary only when it's required in order to help out some other injured or less fortunate person.

## PREPARING FOR THE WINTER ENVIRONMENT

Most people snowshoe and winter camp 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 your body responds to it. Typically, the environment is cold, wet and windy. Travel in deep snow is often painfully 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 trip, try to collect as much information about the weather as possible. Remember that weather forecasts 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's 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 a.m. – and 40°F with heavy rain and high winds by 2:00 p.m.

The Internet, newspaper weather maps, radio and TV reports are all useful. You should check these resources for the latest information:

- Northwest Avalanche Center: <http://www.nwac.us>
- U.S. National Weather Service: <https://www.weather.gov>
- Washington Dept of Transportation: <https://wsdot.com/traffic>



The phenomenon of **adiabatic cooling** occurs in our mountains here in the Pacific Northwest. It can sometimes provide a rough indication of what temperatures to expect in our passes. Its definition is when an air mass is lifted over a mountain range, it cools due to decreasing pressure; as it descends the other side, it warms. The drop in temperature (dry adiabatic lapse rate) is about 5 degrees for every 1,000 feet. If precipitation accompanies the elevation gain, the lapse rate is about 3 degrees for every 1,000 feet. Thus, if the temperature in Seattle is 45°F and it's raining, the temperature on the summit of Snoqualmie Mountain (6,278 feet) should be about 27°F.

## Stay 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).
- Muscular activity by deliberate exercise or involuntary shivering warms your body.
- Reduction of blood flow near the surface of your body (surface blood vessels constrict), reduces circulation in your skin and keeps blood nearer your body's central core for use by your brain, heart and lungs.

Your body loses heat in four ways:

- Evaporation causes a large loss of thermal energy as water changes into 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, and your unprotected head may lose a significant amount 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 in the mountains, particularly when you are in 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 frequently adjusting the amount of clothing you are wearing and by adjusting the pace as necessary.

You can combat heat loss through radiation by remembering: "If your hands or feet are cold, 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

Layering fights convection and evaporation. In the Northwest, you'll need at least three layers for winter activities: a wicking layer, an insulating layer and a layer for wind and rain protection. The details are described well in Freedom.

## Eat and Drink Frequently

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 performance starts to decrease when you lose as little as 2% of your body weight in water. In cold weather, drinking water will help keep you warm. It will increase blood circulation to your extremities. Cold air doesn't hold as much moisture as warm air, so your body will rob itself of water to warm the cold air that you breathe before it gets to your lungs. If you are drinking enough water, your urine will be light colored. Water carries away metabolic wastes and reduces muscle cramps and soreness. Drink water often. Don't hesitate to eat fresh snow for part of your water ration and fill your half-empty bottle with snow. If you get water from a stream, be sure to treat the water for giardia by boiling or by using a filter. Iodine is generally ineffective at low temperatures – it takes too long to work.

Your body burns fuel to stay warm and to work your muscles. You may use up to 6,000 calories on a single-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'll eat.

## Take Rest Breaks

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.

# **WINTER HEALTH HAZARDS**

## **Hypothermia**

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



## Recognizing Hypothermia

As your body cools, your muscles are affected, and your coordination diminishes. You start to shiver uncontrollably. You have difficulty handling a small object, striking a match or tying a knot. You may become apathetic, withdrawn or disagreeable. Your sense of touch and pain will lessen. As your body core temperature drops below 95°F (35°C), you may be confused and sleepy, make poor decisions, walk with difficulty or move stiffly and awkwardly. You stop shivering. Your pulse and respirations slow. Your speech may be slurred. As your core temperature approaches 85°F (30°C), you may become unconscious and your pulse and respiration will weaken or even stop. Your heart may beat erratically or stop completely. If you remain cold for several hours, metabolic changes take place in your body, particularly in your legs and arms. Upon rewarming, these changes may cause major problems that could result in death.

## Preventing Hypothermia

- Prevent heat loss.
- 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 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.
- Drink water and eat food high in fats and carbohydrates (sugars and more complex carbs).
- 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 additional clothing layer.
- Detect Hypothermia Early

Any time you're exposed to wind, cold or wetness, watch each individual for the signs and symptoms of hypothermia. Treatment of early hypothermia is relatively simple compared with the efforts needed to deal with a severely ill individual. The patient may deny having any problems. Believe the signs and the symptoms, not the patient.

## Signs of Hypothermia and Giving First Aid

### Mild Hypothermia:

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



First aid:

- Get the patient out of the cold and wet
- Replace wet clothes with dry; add insulation to clothing
- Place the patient in a warm environment
- 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.

Moderate to Severe Hypothermia:

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

Signs of more severe illness:

- Unresponsiveness
- Decreased pulse and respiration
- Cessation of shivering
- Physical collapse

First aid if the patient will be evacuated promptly:

- End exposure; cover the patient, rather than walking him or her to shelter
- Treat the patient very gently
- Replace wet clothing with dry; cut off clothing to prevent unnecessary movement
- Check the patient for other injury
- Evacuate the patient

First aid if the patient will not be evacuated promptly:

- Begin active re-warming. Concentrate on delivering warmth to the head, neck, armpits and groin areas – heat will most easily reach the core of the body from these regions. Apply hot water bottles (wrapped in a layer of cloth), warmed blankets or another warm body.
- Watch the patient for signs of shock
- Evacuate as soon as possible

A hypothermia patient without pulse and respiration may be revived. No patient should be considered dead until after warming. “No one is dead until warm and dead.” The basic goal of first aid for hypothermia is to prevent further heat loss.

## Frostbite

Frostbite is caused by constriction of surface blood vessels in conjunction with exposure to the cold. Your hands and feet are affected most commonly, but your nose, ears and face are also particularly



susceptible when it's cold. If the temperature continues to drop, circulation will almost completely cease, and frostbite will occur.

### Preventing Frostbite

- Wear enough clothing. Wear a hat, balaclava or hood; mittens rather than gloves; and extra socks if they won't make your boots too tight. Wear a face mask in strong, cold winds.
- Don't wear constricting clothing or boots. Don't wear too many pairs of socks. Exercise your fingers and toes to maintain adequate circulation.
- Don't touch cold metals with bare skin.
- Don't touch cold gasoline with bare skin.
- Watch your partner's face, hands and ears for signs of superficial frostbite.

### Signs of Frostbite and Giving First Aid

#### Superficial Frostbite:

- Skin is pale, dull or waxy and firm to touch
- Deeper tissues remain soft
- May feel pain in the area and may feel intensely cold or numb

#### First aid for superficial frostbite:

- Warm a cold body part by placing it against a warm body part and apply a firm, steady pressure
- Tuck hands into armpits
- Do not rub the frostbitten area (rubbing will damage the skin)

#### Deep Frostbite:

- Skin is pale, dull or waxy
- Deeper tissues, as well as the skin, are hard
- Joint movement may be limited or absent
- The affected part will be painful at first and then become numb and senseless
- Parts of the patient's legs and arms may be affected, as well as the hands and feet

Deep frostbite is a serious problem that can result in the loss of tissue or an entire body part. If tissue loss is to be minimized, it's essential to recognize deep frostbite early and to prevent any further injury, which may result from infection, trauma or allowing the part to thaw and refreeze. Once a frozen part has thawed, the patient may become a stretcher case because the affected part will be extremely painful. Travel on a thawed foot will be almost impossible.

#### First aid for deep frostbite:

- If the patient is hypothermic, treat that first because it's life-threatening
- Keep the frozen part frozen
- Do not rub the frozen area
- Don't let a thawed part refreeze or bear weight
- Evacuate as soon as possible
- Don't attempt thawing if the victim can be transported to hospital within reasonable time



NOTE: Thawing should be undertaken only if refreezing will not take place and the part can be kept under sterile conditions. This will be almost impossible to maintain in the field. Do not start thawing until the patient is sheltered and will not have to assist in the process. To thaw a frozen part, immerse it in a warm 104°F (40°C) to 108°F (42°C) bath kept at a constant temperature by adding warmed water. A thermometer is essential for monitoring the water temperature.

Continue thawing until the affected part is completely thawed -- it should have a red or pink undertone or appear normal all the way to the end of the toes or fingers. If the pink color does not return to the limb in a reasonable time, remove it from the bath. Encourage exercise of thawed toes or fingers during and after thawing. Once thawed, place the part on a sterile pad and put small pieces of sterile gauze between toes and fingers. Protect the thawed part from any further damage, including rubbing by a sheet or blanket. Don't use hot water bottles or place the affected part near a hot stove or fire. Don't disturb blisters. Take the patient to the hospital as soon as possible.

## AVALANCHE AWARENESS

Enabling you to travel safely in the winter mountains is a prime aim of the snowshoe program. Avalanches pose a significant (though largely manageable) threat, with injuries and deaths occurring every year in the Cascades. Avalanche Essentials by Bruce Tremper contains useful details on the nature and causes of avalanches and specifically how to reduce your exposure to risk from them. As snowshoers, we are always aiming to avoid exposure to significant avalanche risk, primarily by careful preparation including choice of terrain and wise decision-making (e.g., whether to go/not-go beforehand or to proceed/turn-back while on a tour). Tremper's style is very readable and it's definitely the case that the more you know, the better your decision-making will be.

Note: Local avalanche forecasts are provided by NW Avalanche Center (<http://www.nwac.noaa.gov> )



## APPENDIX 1. BE PREPARED FOR WINTER WEATHER

If you are planning to travel in the mountains – whether hiking, skiing, snowshoeing or driving – you should be aware of potential differences between weather in Seattle and weather where you are going.

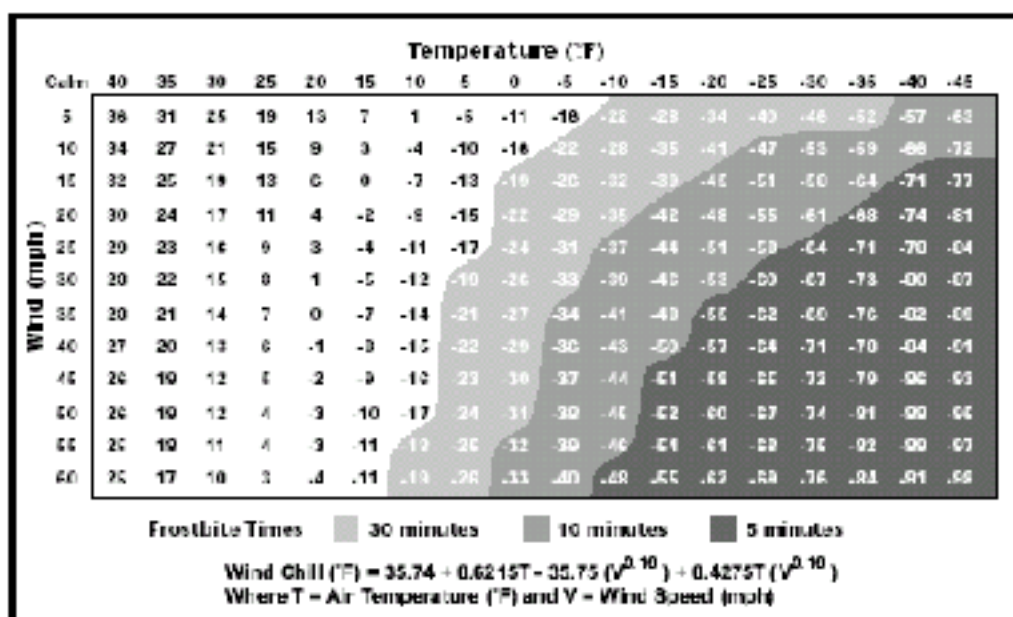
### Regional Temperature Comparisons

The following table illustrates differences in the winter environment among four western Washington locations in the month of February. (These statistics have been collected over approx. 50 years.)

| Weather Variable                  | Sea-Tac | Stevens Pass | Paradise | Snoqualmie Pass |
|-----------------------------------|---------|--------------|----------|-----------------|
| Average maximum temperature       | 49 °F   | 32 °F        | 34 °F    | 37 °F           |
| Average minimum temperature       | 37 °F   | 22 °F        | 22 °F    | 24 °F           |
| Maximum temperature               | 70 °F   | 53 °F        | 60 °F    | 61 °F           |
| Minimum temperature               | 1 °F    | -12 °F       | -18 °F   | -15 °F          |
| Total snowfall                    | 1.7 in. | 80 in.       | 102 in.  | 81 in.          |
| Total rainfall                    | 4.2 in. | 9.2 in.      | 14 in.   | 12 in.          |
| Most single-day rainfall          | 3.1 in. | 4.6 in.      | 7.4 in.  | 6.3 in.         |
| Number of days with precipitation | 16 days | 17 days      | 19 days  | 17 days         |

### Wind Chill

Be sure to bring a hat, mittens, jacket and pants to protect you from windy conditions in the mountains. The following chart shows the effective temperature on exposed flesh when it's windy.







## APPENDIX 2. SAMPLE FIELD TRIP REPORT CARD

Instructors: Please grade each of the items listed below as  
“S” = Satisfactory, “W” = Work needed or “N” = Not satisfactory.

### General / Equipment:

\_\_\_\_\_ Ten Essentials      \_\_\_\_\_ Snowshoes      \_\_\_\_\_ Boots      \_\_\_\_\_ Pack  
\_\_\_\_\_ Conditioning      \_\_\_\_\_ Clothing

### Winter Camping:

\_\_\_\_\_ Proper overnight equipment      \_\_\_\_\_ Food preparation  
\_\_\_\_\_ Tent site selection      \_\_\_\_\_ Water preparation  
\_\_\_\_\_ Tent pitching

### Snow Shelter Construction: Type (circle one):      Cave      Igloo      Trench

\_\_\_\_\_ Site selection      \_\_\_\_\_ Quality of final product  
\_\_\_\_\_ Construction techniques

Instructors: Please indicate with a checkmark that  
each of the items listed below was covered during instruction.

### Winter Camping:

\_\_\_ Techniques for keeping warm      \_\_\_ Cold weather camping skills

This student completed all of the requirements of this field trip to the instructor's  
satisfaction (circle one):      Yes      No

Comments: \_\_\_\_\_

\_\_\_\_\_

Instructor: \_\_\_\_\_ Date: \_\_\_\_

Student: \_\_\_\_\_



## APPENDIX 3. REFERENCES AND ADDITIONAL READING

*This list includes references from the syllabus text as well as recommendations for further reading.*

### Avalanche and First Aid

Avalanche Safety for Skiers and Climbers, Second Edition. Tony Daffern. Calgary: Rocky Mountain Books, 1992.

Mountaineering First Aid: A Guide to Accident Response and First Aid Care, Fifth Edition. Jan D. Carline, Steven C. MacDonald and Martha J. Lentz. Seattle: The Mountaineers, 2004.

Snow Sense: A Guide to Evaluating Snow Avalanche Hazard, Fifth Edition. Jill A. Fredston, Douglas S., Fesler. Anchorage: Alaska Mountain Safety Center, 2011.

The ABCs of Avalanche Safety, Third Edition. Sue A. Ferguson, Edward R. LaChapelle, Ed LaChapelle. Seattle: The Mountaineers, 2003.

The Avalanche Handbook. Third Edition, David McClung and Peter Schaerer. Seattle: The Mountaineers, 2006.

The White Death: Tragedy & Heroism in an Avalanche Zone. McKay Jenkins. Anchor, 2001.

### Conditioning

Conditioning for Outdoor Fitness. 2<sup>nd</sup> Edition, David Musnick, Mark Pierce, Sandy Elliott and Mark A.T.C. Pierce. Seattle: The Mountaineers, 2004.

Smart Exercise: Burning Fat, Getting Fit, 2nd Edition. Covert Bailey. Boston: Mariner Books, 1996.

The Winter Athlete: Secrets of Wholistic Fitness for Outdoor Performance. Steve Ilg. Boulder, Co: Johnson Books, 1999.

### General

Mountaineering: The Freedom of the Hills, 9<sup>th</sup> Edition. Julie Van Pelt and Kris Fulsaa (Editors). Seattle: The Mountaineers, 2017.

### Navigation

Be Expert with Map and Compass. Bjorn Kjellstrom. John Wiley and Sons, 1994.

GPS Made Easy: Using Global Positioning Systems in the Outdoors, Fifth Edition. Lawrence Letham. Seattle: The Mountaineers, 2008.

Land Navigation Handbook: The Sierra Club Guide to Map and Compass. William S. Kals. San Francisco: Sierra Club Books, 1983.

Staying Found: The Complete Map & Compass Handbook, Third Edition. June Fleming. Seattle: The Mountaineers, 2001.

Wilderness Navigation: Finding Your Way Using Map, Compass, Altimeter & GPS. Second Edition, Bob Burns and Mike Burns. Seattle: The Mountaineers, 2004.

### Snowshoe Techniques

Snowshoeing: From Novice to Master, Fifth Edition. Gene Prater. Seattle: The Mountaineers, 2002.



## Survival

AMC Guide to Winter Camping: Wilderness Travel and Adventure in the Cold-Weather Months. Stephen Gorman. Boston: Appalachian Mountain Club Books, 1991.

Outdoor Living: Problems, Solutions, Guidelines. Eugene H. Fear, John Simac and Everett Lasher, George Cashman, Lee Tenger, James Haneline, Mountain Rescue Association, 2000

Snow Caves for Fun and Survival, Revised Edition. Ernest Wilkinson. Boulder: Johnson Books, 1992.

## Weather

Northwest Mountain Weather: Backcountry Forecasting for the Hikers, Campers, Climbers, Skiers, Snowboarders. Jeff Renner. Seattle: The Mountaineers, 2005.

## Winter Health

Colour Atlas of Mountain Medicine. Jacques Vallotton and Frederic Dubas (Editors). St. Louis: Mosby Year Book, 1991.

Fatigue – Exhaustion, Hypothermia and Survival. Tacoma Unit, Mountain Rescue Council, Pamphlets.

Hypothermia: Death by Exposure. William W. Forgey. Merrillville: ICS Books, 1985.

Hypothermia, Frostbite and Other Cold Injuries: Prevention, Recognition and Prehospital Treatment. Second Edition, : James A. Wilkerson (Editor), Cameron C. Bangs and John S. Hayward. Seattle: The Mountaineers, 2006.

Secrets of Warmth: Warmth for Comfort or Survival. Hal Weiss. Seattle: The Mountaineers, 1999.

The Basic Essentials of Hypothermia. William W. Forgey. Merrillville: ICS Books, 1991.



## APPENDIX 4. IMPORTANT WEB SITES AND APPS

### **Web Sites:**

Many of the below sites also have mobile friendly sites or apps that you can download to your phone.

### **The Seattle Mountaineers:**

<http://www.mountaineers.org>

### **The U.S. National Weather Service**

206-526-6087

<http://www.weather.gov/>

### **Northwest Avalanche Center**

(206) 909-0203

<http://www.nwac.us/forecast/weather/current>

### **National Weather Service Forecast Office in Seattle:**

<http://www.wrh.noaa.gov/sew>

### **Washington State DOT**

<http://www.wsdot.wa.gov/traffic/>

### **Phone Numbers and Websites for Winter Recreation in Washington State Backcountry Information / Permits**

**Mount Rainier National Park** 360-569-2211

Winter Recreation at Mount Rainer National Park:

<https://www.nps.gov/mora/planyourvisit/winter-recreation.htm>

**Olympic National Park** 360-452-4501

<https://www.nps.gov/olym/planyourvisit/visiting-in-winter.htm>

**Washington State Parks Info** 800-233-0321

<http://parks.state.wa.us/130/Winter-Recreation>

**North Bend Ranger Station (USFS)** 425-888-1421

[https://www.fs.usda.gov/detail/mbs/about-forest/offices/?cid=FSBDEV7\\_001660](https://www.fs.usda.gov/detail/mbs/about-forest/offices/?cid=FSBDEV7_001660)

**Snoqualmie Pass Visitor Station (USFS)**

<https://www.fs.usda.gov/detail/mbs/about-forest/offices/?cid=stelpdb5238217>

Mt Baker Ranger Station 360-856-5700

North Cascades National Parks 360-856-5700

Skykomish Ranger Station 360-677-2414

### **Alpine Snow Phones and Websites**

The Pass 206-236-1600

<http://www.summitatsnoqualmie.com/conditions>



Stevens Pass 206-634-1645  
<https://www.stevenspass.com>

Mt Baker 360-671-0211  
<https://www.mtbaker.us/snow-report>

**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               |

Additional Information regarding permits and winter recreation in Washington State's Public Lands:

This link at the Washington Trail Association provides information regarding what you will need in terms of Snow Passes and parking permits.

<https://www.wta.org/go-outside/trail-smarts/how-to/how-to-visit-a-sno-park>

FYI

You need a permit to park at a SNOPARK between November 1 and April 30. Learn which permit is right for you and [purchase your permit online](#) starting November 1.

- **ONE-DAY PERMIT**  
\$25 per day. Valid at all SNOPARK including special-groomed trails until midnight on the day purchased.
- **SEASONAL PERMIT**  
\$50 per season. Seasonal Permits are valid at all regular SNOPARK locations. For special groomed trail locations you'll need this pass plus the special groomed trails permit (below). If you know you'll be going out two or more times it's a better deal to buy the seasonal permit.
- **SPECIAL GROOMED TRAILS PERMIT**  
\$70 add-on per season. Certain SNOPARKs are designated as having special groomed trails. For annual access to these areas you need both a seasonal permit (above) and this add-on permit. The special groomed trail locations are Cabin Creek, Chiwawa, Crystal Springs, Hyak, Lake Easton, Lake Wenatchee, Mount Spokane and Nason Ridge where trails are groomed for cross-country skiers.

The revenue from permits pays for parking lot plowing, trail grooming, education and ongoing maintenance of this program.



There are a number of apps available for iPhone and Android. These range from weather forecast to avalanche forecast to driving resources.



**WSDOT**

Washington State  
Department of Transp...

OPEN



**Snow Report  
& Forecast**

LW Brands, LLC

GET

on App  
Store and



**NWAC**

NWAC

OPEN



**OnTheSnow Sk  
& Snow Report**

SkiReport.com mobile

GET



**Gaia GPS:  
Mobile Trail M...**

Hiking, Overlanding,...

OPEN



**CalTopo**

CalTopo LLC

OPEN



**WTA**

**Trailblazer: Go**

Washington Trails A...

OPEN



## APPENDIX 5. WINTER CAMPING COURSE GRADUATION APPLICATION

Fill out both sides of this form (graduation application and survey)  
email your application to:

Tim Lawson: [timlawsonwild@msn.com](mailto:timlawsonwild@msn.com)

Or return to the Clubhouse in an envelope.

Address it to: Snowshoeing Committee (Graduation Application)  
Attn: Tim Lawson  
The Mountaineers  
7700 Sand Point Way NE  
Seattle, WA 98115

Name: \_\_\_\_\_

I hereby apply for graduation from the Winter Camping Course, given by The Seattle Mountaineers, having met the following requirements:

- attended the lecture
- attended the field trip

Your signature: \_\_\_\_\_

Please send my graduation certificate to me at the following address:

\_\_\_\_\_ (street address, apt. #)

\_\_\_\_\_ (city, state, zip code)

Your e-mail address: \_\_\_\_\_ Telephone #: \_\_\_\_\_



## APPENDIX 6. RESOURCES FOR GETTING GEAR

Snowshoe rentals are available as follows:

1. REI Seattle, 222 Yale. 206 223-1944
2. Second Ascent, 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

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
- 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](http://www.sierratradingpost.com) – Online and catalogue
- [www.campmor.com](http://www.campmor.com) – Online and catalogue
- [www.backcountry.com](http://www.backcountry.com)
- [www.steepandcheap.com](http://www.steepandcheap.com)
- [www.rei.com/rei-garage](http://www.rei.com/rei-garage)
- [www.geartrade.com](http://www.geartrade.com)
- [www.backcountrygear.com](http://www.backcountrygear.com)
- Craigslist
- eBay
- Freecycle





## CREDITS

The editors gratefully acknowledge the contributions of the authors, collaborators, snowshoers and Mountaineers who made the preparation of previous versions possible. In particular, the editors thank those who are listed below. The editors have taken some license with format, syntax, punctuation and order of topics and have made some revisions for clarity, coherence, correctness and continuity – and we apologize for any errors.

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## WINTER CAMPING COURSE EVALUATION

Thank you for taking the time to give us feedback. The only way we can ensure that we meet the needs of our students and members is to hear from you – both when we do well and when we need to improve. If you wish to remain anonymous, please photocopy this page and send it separately.

1. Were you hoping for information or training that you didn't get?  
[ ] Yes      [ ] No      Describe:
  
2. Was there information or training that was unnecessary?  
[ ] Yes      [ ] No      Describe:
  
3. Do you have suggestions for improving or modifying the course?  
[ ] Yes      [ ] No      Describe:
  
4. Where and how did you hear about this course?
  
5. We'd love to hear any other comments or suggestions. Please write your comments below or, if you prefer, attach a separate sheet. If you would like a response, please indicate that and include your name and address.