

OSAT

We Can Do Together



What We Can't Do Alone

2019 Glacier Climbing Course Syllabus

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OSAT Traditions

1. Every OSAT activity has a designated leader. The leader makes the decision as to who is qualified for the activity. This decision must be based on principles, not personalities.
2. Alcohol, recreational cannabis, and illegal drugs are not allowed on any OSAT activity.
3. Party members are not to separate from the group without permission of the activity leader.
4. An OSAT leader should have completed a Wilderness First-Aid course or equivalent, or ensure that at least one participant in the activity has done so.
5. When in a wilderness area, each party member will carry the Ten Essentials.
6. Outdoor activities start with the Serenity Prayer while forming a circle.
7. Every OSAT glacier climb will have at least two rope teams that include a person with crevasse rescue training.
8. Anyone can volunteer to lead an activity - even a technical climb. As a participant, you may want to “qualify” your leader. As a leader, you should be certain that everyone on that activity has signed a Release and Indemnity Agreement.
9. Party size for OSAT activities will adhere to the rules of the appropriate jurisdiction.



OSAT Risk Disclosure

To participate in the GCC you must sign a release where you acknowledge “you personally assume all risks in connection with these activities”.

Mountaineering is inherently dangerous, and that danger generally increases when you climb at higher levels. In nature, nothing is guaranteed; although you may do your best to minimize the objective hazards, you cannot control all variables, such as weather, rock fall, snow bridges collapsing, falls by other rope teams, avalanches, hypothermia, etc.

While you may have the technical skills to climb the mountains of your desire, we would like you to pause to consider the financial impact that an accident would have to you and your loved ones. A broken leg (\$7,500) with a 3-day hospital stay (\$30,000) and four to six weeks off work (\$6,000) could easily leave you with a \$7,500 bill - even with medical coverage that covers 80 percent. This could be at the low end of a serious accident.

We are not requiring that you take any particular action, or requiring any level of medical or accident insurance. We only ask that you acknowledge that you have considered these risks.

OSAT Board of Trusted Servants (BOTS)

OSAT GCC Committee

OSAT Safety Committee

OSAT

GLACIER CLIMBING COURSE 2019 COMMITTEE



KRISTI GOETZ - CHAIR



MAT KASPER - VICE CHAIR



NAOMI PARK - CLIMBS



MIKE WARNER - CONDITIONERS



COBY HENDRICKS - FIELD TRIPS



BEN PODAWILTZ - SEMINARS



JAIME PARDO - SAFETY/ADVISORY



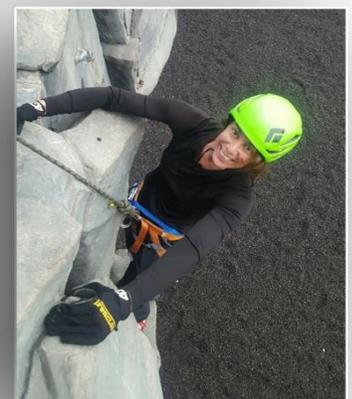
MIKE OUELLET - STEWARDSHIP & PORTERS



CARLY GINTZ - REGISTRAR



ROB BODKIN - LEADERSHIP DEVELOPEMENT



FELICIA DURAND - SYLLABUS

OSAT Glacier Climbing Course

2019 Course Overview

Welcome to the 29th annual OSAT Glacier Climbing Course! We hope in the coming months you will enjoy the friendship and fellowship that is uniquely OSAT. In this course, you will gain the skills and experience necessary for a safe and enjoyable mountaineering experience. Our motto is “Keep Climbing Mountains and Don’t Slip!”

OBJECTIVE: To provide a safe and proficient basic mountaineering course for members and friends of Twelve Step recovery, concluding with a summit of one of Washington’s glaciated peaks.

Students of the 2019 GCC will acquire necessary skills, knowledge and experience to successfully participate in climbing glaciated mountains.

KEY FACTORS: Attaining these objectives will require persistence and dedication. Many graduates of the glacier climbing course began with no mountaineering experience, yet they were able to successfully summit a glaciated peak at the culmination of the course. Our previous years’ success can be attributed to the following key factors:

- **Safety**
- **Physical conditioning**
- **Personal responsibility**
- **Teamwork**
- **Clear and constructive communication**
- **Proficiency using glacier climbing equipment**
- **Good judgment and positive attitude**
- **Cooperative weather**

CORE VALUES: Trust, Respect, Courage, Commitment and Integrity

- **Trust** your mentors and volunteers to provide a safe environment.
- **Respect** yourself, your team, your mentors, volunteers and the program.
- **Courage** to embrace new adventure and overcome personal fears.
- **Commitment** to take ownership of your experience.
- **Integrity** in words and actions; be your best self.

OSAT Glacier Climbing Course 2019 Policies and Procedures

Required Study Material: In addition to the course syllabus, you are required to read selections from Mountaineering: The Freedom of the Hills, Mountaineers Books, 9th Edition (2017). This 'bible' of the course is often referred to simply as "Freedom of the Hills" or "Freedom".

Course Fee Refunds: The last day to withdraw from the course for a full refund is February 4th, 2019. This request must be made by email to the Registrar in order to be processed. There are no refunds thereafter for students removed from the course due to unsafe behavior, unwillingness to abide by club traditions, or disrespect for instructors.

Attendance: Students are expected to attend and successfully complete all seminars, field trips, and required conditioners. It is the student's responsibility to sign in at each course event. Excessive tardiness may be grounds for dismissal from the course at the discretion of the committee.

OSAT and the GCC adhere to a 12-person party limit (unless local jurisdictions and events dictate otherwise). DO NOT show up for activities for which you are not registered. Non-GCC students, dogs, children, and separating from the group or leaving early are all strictly prohibited.

Any smoking or vaping, if allowed by state and local rules, should take place 100 feet away from group activities.

Skill Levels: Students must be able to pass conditioning time trials, course midterm, and show proficiency at crevasse rescue, before being allowed to proceed with a GCC graduation climb.

Conditioners: To satisfy the requirements of the course, students must complete a minimum of one GCC conditioner per month. It is the student's responsibility to sign up for the conditioner, to be on time and prepared for the outing per the description on the calendar event page. If for any reason you need to cancel your registration, it is the student's responsibility to contact the conditioner leader. Late night and 'morning of' cancellations should be for emergencies only. If a student no calls/no shows to three conditioners, they may be removed from the course. Carpooling is strongly recommended.

Once you have completed your monthly conditioning requirement, you may sign up for another conditioner (no earlier than two days prior to the activity) so other students have an opportunity to meet their requirement.

Stewardship: OSAT is one of the largest outdoor activity clubs in the Northwest. We have a great impact on the wilderness environment we love and use, and we want it to be a positive one. As members of OSAT, it is important that we become stewards of the wilderness. This means using "Leave No Trace" travel and camping techniques and actively contributing to environmental projects.

All students must complete a day of volunteer stewardship as a requirement for your graduation climb. Stewardship must consist of one day of volunteer physical labor (preferably places used by OSAT). Typical activities often include trail work, habitat restoration, tree planting, or invasive

species removal. Events are a great way to fellowship with fellow classmates and OSAT members. These dates are to be determined.

If you are unable to attend the monthly group events, below are other acceptable organizations that students can schedule their stewardship event through:

- Washington Trails Association: www.wta.org
- EarthCorps: www.earthcorps.org
- Mountains to Sounds Greenway Trust: www.mtsgreenway.org
- Green Seattle Partnership: www.greenseattle.org

Upon completion, students will need to provide proof of attendance to the Stewardship chair to be eligible for your graduation climb. On an organized OSAT event proof of attendance will be submitted by the primary lead instructor; otherwise attendance sheets can be found online @ OSAT Glacier Climbing Course under 2019 course documents. Further reading on Leave No Trace can be found in Freedom of the Hills Chapter 7.

Written Exam: There will be a written exam which is designed to test your knowledge of the content covered throughout the course. The questions will consist of multiple choice and fill-in the blank questions. The topics in the exam come directly from topics covered in the course.

Tie-In Exam: In addition to the written test, you will participate in a full tie-in test. For the tie-in test, you should be prepared to do a full tie-in (see syllabus page 26) without notes, or help from your peers.

If you are unable to pass the tie-in or written exam, you may be required to go in front of the committee and risk being dismissed from the course.

Climb Assignments: Attendance at all course events does not guarantee a student's position on class climbs. Eligible students will have the opportunity to climb Mount Baker or Eldorado Peak as a graduation climb. After a successful graduation climb, you may be invited to climb Mount Rainier. **We cannot guarantee anyone their first preference for a specific date or route so students need to leave all dates open.**

Certificate of Graduation: A GCC Certificate of Graduation will be presented to students who pass all GCC requirements and successfully complete one glacier climb requiring roped travel. The certificate will be presented at the Gratitude Dinner in November.

Safety: If you observe something that you believe is unsafe, immediately bring it to the attention of the nearest Instructor, Field Trip Leader, or Committee Member. You can also report your concerns to safety@osat.org.

Disclaimer

The committee reserves the right to exclude from the course without further justification any student who misses a required course event, displays unsafe behavior, is unwilling to accept instruction, proves unable to adequately perform skills, or fails to abide by club traditions.

OSAT Glacier Climbing Course 2019 Course Calendar

Students must attend each of the activities listed below. The only exception is the Ice Axe Field Trip, for which a single date option must be chosen. In addition to the dates below, students must also complete one conditioner per month, which will require electronic sign-up on the OSAT Events Calendar.

Event	Date	Time	Location
<i>Seminar I</i>	Mon Feb 4	6pm - 8:30pm	Highlands Community Center, Bellevue, WA
<i>Knots/Tying-In Field Trip</i>	Sat Feb 9	9am - 3pm	Mercer Island Congregational Church
<i>Seminar II</i>	Mon Mar 4	6pm - 8:30pm	Highlands Community Center, Bellevue, WA
<i>Navigation/Rope Skills Field Trip</i>	Sat Mar 9	8am - 4pm	Mountaineers South Climbing Wall, Magnuson Park 7700 Sand Point Way NE Seattle, WA 98115
<i>Seminar III</i>	Mon Apr 1	6pm - 8:30pm	Highlands Community Center, Bellevue, WA
<i>Ice Axe Field Trip Option 1</i> OR <i>Ice Axe Field Trip Option 2</i>	Sat Apr 6 OR Sat Apr 13	8am - 4pm 8am - 4pm	TBD – Typically Snoqualmie or Stevens Pass
<i>Seminar IV Including Midterm Exam</i>	Mon May 6	6pm - 8:30pm	Highlands Community Center, Bellevue, WA
<i>Roped Travel/Snow Camp Field Trip</i>	May 18-19	8am Saturday- 5pm Sunday	TBD – Typically Stevens Pass
<i>Camp Muir Time Trials</i>	All-Day Trip to Camp Muir on Rainier in May - TBD		
<i>Seminar V</i>	Mon June 3	6pm - 8:30pm	Highlands Community Center, Bellevue, WA
<i>Gas Works Park Field Trip</i>	Wed June 5	6pm - 8:30pm	Gas Works Park, Seattle
<i>Crevasse Rescue Field Trip</i>	June 8-9	8am Saturday- 5pm Sunday	Mt Baker, Easton Glacier, Mt. Baker NRA/Wilderness
<i>Graduating Glacier Climbs Baker or Eldorado</i>	TBD	2 Days	Possible dates: June 15-16 June 22-23, June 29-30
<i>Mount Rainier Climbs</i>	TBD	3 Days	Possible dates: July 6-8, July 13-15, July 20-22

*Please note that the dates and locations listed above are subject to change due to various reasons, including road and mountain conditions. Field trip completion times may vary from those listed. Please pay attention to any changes announced at course events or via email as the course progresses.

OSAT Glacier Climbing Course 2019

Equipment List

What to buy - and When

February: Conditioners are starting, and it is the middle of the winter - begin experimenting with clothing systems.

Equipment	Critical Specifications	Example
Textbook	<i>Mountaineering: The Freedom of the Hills</i> - 9 th Edition (2017)	(The one and only!)
Harness	Must have a belay loop	Black Diamond <i>Couloir, Momentum, or Primrose</i>
Carabiners	1 large locking pear-shaped carabiner 4 locking carabiners (avoid oval-shaped) 7 (or more) non-locking carabiners (recommend wire gate to reduce weight)	Black Diamond <i>RockLock</i> screwgate Black Diamond <i>Pearabiner</i> or Metolius <i>Element</i> Black Diamond <i>Neutrino</i> or C.A.M.P. USA <i>Nano 22</i>
Rescue Pulley		SMC <i>CRx</i> Pulley or Petzl <i>Oscillante</i>
Webbing	(2) 9-foot pieces, 5/8", color A (3) 5-foot pieces, 5/8", color B (1) 8-foot piece, 1"	TAKE LIST TO REI AND ASK FOR HELP CUTTING
Perlon	3 segments of 6mm Perlon based on <u>your height</u> : <ul style="list-style-type: none"> • Up to 5'0": 4.5', 11', and 4' • 5'0"-5'6": 5', 11.5', and 4' • 5'6"-6'0": 5.5', 12', and 4' • Over 6': 6', 13', and 4' 	TAKE LIST TO REI OR ASCENT OUTDOORS AND ASK FOR HELP CUTTING. (Ascent Outdoors carries a preferred perlon)
Personal Anchor	Metolius <i>Personal Anchor System</i>	Metolius <i>PAS 22</i> (must be this - no substitutions)
Belay Device	Tube style; preferred, that has teeth.	Black Diamond <i>ATC-XP</i>
Belay Gloves	Leather grip	Petzl <i>Cordez</i> or leather garden gloves
Sit Pad	Insulation	REI sit pad or <i>Z-Lite</i> sleeping pad
Traction Devices	<u>Spiked</u> traction system; avoid coils. Not recommended: Yaktrax	Kahtoola <i>MICROspikes</i>
Socks	Wool/poly blend - no cotton. (Some prefer to use liner socks and outer socks. Liners should be thin, reduce friction - no cotton.)	SmartWool hiking socks REI Merino wool liner socks
Base Layer Shirt	Moisture-wicking poly blend - no cotton.	Short- and long-sleeve shirts
Insulation Shirts	Sweater or hoodie. Merino wool, fleece, or poly blend - no cotton	Kuhl <i>Kobra</i> Sweater

(cont. – February)

Equipment	Critical Specifications	Example
Insulation Jacket	Down or synthetic, hood preferable, 700+fill. Some combine multiple down jackets.	REI <i>Revelcloud</i>
Rain Jacket	Gore-tex (or equivalent), vent zippers, helmet compatible hood.	Outdoor Research <i>Helium II</i>
Base layer Pants	Wool/poly blend - no cotton.	SmartWool midweight long underwear bottoms
Insulating Pants (Optional)	Wool/poly blend - no cotton.	Patagonia <i>Simul Alpine</i>
Rain Pants	Prefer full side zippers (allows you to put on over crampons), Gore-Tex or equiv.	Outdoor Research <i>Furio</i>
Insulating Hat	Wool/nylon - no cotton	SmartWool Beanie
Gloves (Waterproof)	Gore-Tex or equivalent	Outdoor Research <i>Arete</i>
Glove Liners	Wool/poly blend	REI Liner Gloves
Gaiters	Knee high with heavy canvas bottom	Outdoor Research <i>Crocodile</i>
Overnight Backpack	50 liters or larger, fitted by torso length; ice axe loop(s).	Men: Osprey <i>Atmos AG 65</i> Women: Osprey <i>Aura 65</i>
Pack Cover	Size to pack	Gregory, REI, Sea to Summit
Hydration	Nalgene <u>and</u> hydration bag with tube	Wide mouth Nalgene 32oz CamelBak <i>Antidote Reservoir 2-3L</i>
Gear ID	A way to mark your gear as yours.	Tape or fingernail polish.

March: Continue experimenting with clothing systems. Be thinking about temperature management, clothing weight, and layers. Continue improving your Ten Essentials. Experiment with trail food.

Equipment	Critical Specifications	Example
Helmet	Must be a <u>climbing</u> helmet. SKI/SNOWBOARD HELMETS ARE NOT PERMITTED	Petzl <i>Elia/Elios</i> Black Diamond <i>Half Dome</i>
USGS Maps	Mount Rainier East, 7 ½ minute series. Mount Baker, 7 ½ minute series.	Provided
Compass	Transparent base with direction, sighting mirror, bezel marked 0 to 360 degrees (in increments of two degrees or less), meridian lines, a ruler or gradient scale engraved on one of the straight edges. Must have Adjustable Declination.	Suunto <i>MC-2</i>
Mountaineering Boots	Leather or Synthetic, Gore-Tex, insulated if you get cold feet.	Scarpa <i>Charmoz</i>
Headlamp	80-200 Lumens	Petzl - Tikka

April: Ice axe field trip. Clothing systems should be dialed in, trail food preferences identified.

Equipment	Critical Specifications	Example
Ice Axe	B-rated, lightweight, straight shaft Length: The spike should be at your ankle bone when holding axe with arm at your side.	Black Diamond <i>Raven</i>
*Shovel	Collapsible(ideally), light weight	BCA <i>Bomber</i>

*Shared Gear

May: Muir Time trial and the first overnight trip.

Equipment	Critical Specifications	Example
Glacier Glasses	Blocks 100% of UV rays; side shields.	Julbo <i>Sherpa</i>
Sleeping Bag & Compression Sack	Down or synthetic; 20° rating or colder; lightweight.	Marmot <i>Trestles 15</i>
Sleeping pad	Insulated; look for a higher R-value. (Many people combine a closed-cell foam pad with one of the examples provided, for extra warmth.)	-Therm-a-Rest <i>NeoAir XLite</i> -Big Agnes <i>Air Core Insulated</i>
*Tent	3-4 season, rainfly, vestibule, lightweight.	Mountain Hardwear <i>EV 2</i>
*Stove/ Fuel	Performs well in cold, high wind and altitude.	-MSR <i>Reactor</i> -JetBoil <i>MiniMo</i>
*Water Filter	Pump, gravity, squeeze-filter or UV; lightweight.	-Katadyn <i>Hiker PRO</i> -Sawyer <i>Squeeze</i>
Spoon/ Fork	Lightweight	
Bowl and/or Cup	Lightweight, packable	
Crampons	10-12 point; steel recommended over aluminum. MUST BE COMPATIBLE WITH YOUR BOOTS	-Grivel <i>G-12</i> -CAMP USA <i>Stalker</i>
Sun Protection Hat		Outdoor Research <i>Sun Runner</i>

*Shared Gear

June: All required gear should be obtained in time for the crevasse rescue field trip in early June.

February

Seminar 1

Introduction to OSAT and the GCC

Monday, February 4th – 6:00-8:30pm

Highlands Community Center - 14224 Bel-Red Rd, Bellevue, WA 98007

Field Trip 1

Knots and Tying-in

Saturday, February 9th – 9:00am-3:00pm

Congregational Church of Mercer Island - 4545 Island Crest Way, Mercer Island

Conditioner 1

Sign up on the OSAT Events Calendar

New Skills

Principles of Leave No Trace

The Ten Essentials

Clothing Systems

Overhand Knot

Water Knot

Figure Eight on a Bight Knot

Daisy Chain

Double Fisherman's Knot

Prusik Knot

Butterfly Knot

Girth Hitch

Full Tie-In with Rewoven Figure Eight

Full Tie-In with Double Bowline

Preparing for a Conditioner

Seminar 1: Introduction to OSAT and the GCC

Monday, February 4th – 6:00-8:30pm

Highlands Community Center - 14224 Bel-Red Rd, Bellevue, WA 98007

Goal: Gain an introduction to the GCC and its history, review basic outdoor principles and knots, and meet your mentor.

Required Reading:

1. *Freedom of the Hills*:
 - a. Chapter 1 – First Steps – entire chapter
 - b. Chapter 2 – Clothing and Equipment – pp. 17-34
 - c. Chapter 4 – Physical Conditioning – entire chapter
 - d. Chapter 7 – Leave No Trace – entire chapter
 - e. Chapter 8 - Access and Stewardship – entire chapter
2. GCC Syllabus 2019:
 - a. Seven Principles of Leave No Trace, p. 19
 - b. The Ten Essentials, p. 20

Required equipment:

Freedom of the Hills
Seat Harness
Personal anchor
All carabiners
Rescue pulley
Belay device and gloves
Webbing (6 pieces)
Perlton (3 pieces)

What you will receive:

Syllabus
Mentor List
Rope remnant



Field Trip 1: Knots and Tying-In

Saturday, February 9th – 9:00am-3:00pm

Congregational Church of Mercer Island - 4545 Island Crest Way, Mercer Island

Goal: To assemble your seat harness as it should be worn for roped travel and to become proficient using the knot tying skills we will utilize throughout the GCC course.

Required Reading:

1. *Freedom of the Hills:*
 - a. Ch. 9: Knots, pp. 154-161 & Runners, pp. 167-168
2. GCC Syllabus 2019:
 - a. Knots, pp. 21-25
 - b. Full tie-in checklist, p. 26

What to bring:

1. Syllabus
2. Seat harness
3. Personal anchor
4. All carabiners
5. Rescue pulley
6. Belay device and gloves
7. Webbing (6 pieces)
8. Perlon (3 pieces)
9. Rope remnant
10. Snack

What you will make:

1. 3 short runners
2. 2 long runners
3. 1 chest harness
4. 1 foot prusik
5. 1 harness prusik
6. 1 hero loop

February Study Questions

1) Give two examples in each category of the Ten Essentials:

F	1.	2.
I	1.	2.
N	1.	2.
E	1.	2.
R	1.	2.
F	1.	2.
I	1.	2.
S	1.	2.
H	1.	2.
N	1.	2.

2) List the purpose for each knot in the GCC:

Girth hitch:

Rewoven figure eight:

Overhand knot:

Double bowline:

Water knot:

Fisherman's / double fisherman's knot:

Prusik knot:

Daisy chain:

Butterfly:

Figure Eight on a Bight:

3) How do you stay warm when you're wet?

4) What is the key to happy feet?

5) A full mountaineering boot must strike a balance between being tough enough to withstand being scraped on rocks and rigid enough for _____ steps in hard snow and wearing _____, yet comfortable enough for the approach hike.

6) List the purpose for each layer of clothing:

Base layer:

Mid layer:

Shell layer:

7) Why do we say "no" to cotton?

8) When hiking, who has the right of way - uphill or downhill; why?

9) What is Beta? List 3 online resources discussed at Seminar 1

10) Apply the _____ foot rule to take care of business, well away from water sources, trails, campsites and gathering areas.

Seven Principles of Leave No Trace

Plan Ahead and Prepare

- Know the regulations and special concerns for the area you'll visit.
- Schedule your trip to avoid times of high use.
- Visit in small groups when possible. Consider splitting larger groups into smaller groups.
- Repackage food to minimize waste.
- Use a map and compass to eliminate the use of marking paint, rock cairns or flagging.

Travel and Camp on Durable Surfaces

- Concentrate use on existing trails and campsites.
- Walk single file in the middle of the trail, even when wet or muddy.
- Keep campsites small. Focus activity in areas where vegetation is absent.

Dispose of Waste Properly

- Pack out all trash, leftover food and litter.
- Deposit solid human waste in cat holes dug 6 to 8 inches deep, at least 200 feet from water, camp and trails. Cover and disguise the cat hole when finished. When above tree line, pack out solid waste.
- Pack out toilet paper and hygiene products.
- To wash yourself or your dishes, carry water 200 feet away from streams or lakes and use small amounts of biodegradable soap. Scatter strained dishwater.

Leave What You Find

- Preserve the past: examine, but do not touch cultural or historic structures and artifacts.
- Leave rocks, plants and other natural objects as you find them.
- Avoid introducing or transporting non-native species.

Minimize Campfire Impacts

- Campfires can cause lasting impacts to the backcountry. Use a lightweight stove for cooking when possible.
- Where fires are permitted, use established fire rings, fire pans, or mound fires. Keep fires small.

Respect Wildlife

- Observe wildlife from a distance. Do not follow or approach them. Never feed animals.
- Protect wildlife and your food by storing rations and trash securely.
- Avoid wildlife during sensitive times: mating, nesting, raising young, or winter.

Be Considerate of Other Visitors

- Respect other visitors and protect the quality of their experience.
- Be courteous. Yield to other users on the trail, stepping to the downhill side of the trail.
- Take breaks and camp away from trails and other visitors.

The Ten Essentials, OSAT Style “FINER FISHN”

First Aid: Be prepared for blisters, bleeding, cramping, nausea, cuts, sprains, allergies and worse. Hiker First Aid kits are available at outdoor stores, or you can make your own.

Illumination: Headlamp, flashlight, extra batteries, extra bulb.

Navigation: Map, compass, pencil and the knowledge to use them.

Emergency Shelter: Emergency ultra-light bivy sack or garbage bag.

Repair Kit: Duct tape, extra perlon and webbing, multi-tool, safety pins, needle & thread, patch kit. You need to be prepared to fix broken gear, mend ripped tent and jackets and face the unexpected.

Fire: Waterproof matches, butane lighter, fire flint or stove. You need to be able to start an emergency fire. Some climbers like to have a stove to melt snow for hydration.

Insulation: Extra clothing, down or synthetic parka. Waterproof and windproof shell with a hood, shell pants. Waterproof over-mitts and gaiters. Extra dry hats, mittens and socks. Insulated sit-pad or sleeping pad.

Sun Protection: Glacier goggles, sunscreen, lightweight protective clothing and hats.

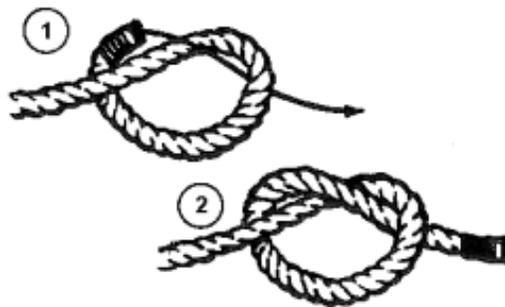
Hydration: A water bottle and at least one more liter of water than you think you will need. Stay hydrated - hot weather, high altitudes and long exertions will make you thirstier than you think. If you are confident of the route and know there is a water source, you can also carry a water filter and/or stove.

Nutrition: Extra food. Pack at least one day's supply of ready to eat food that you will not be tempted to eat except in an emergency.

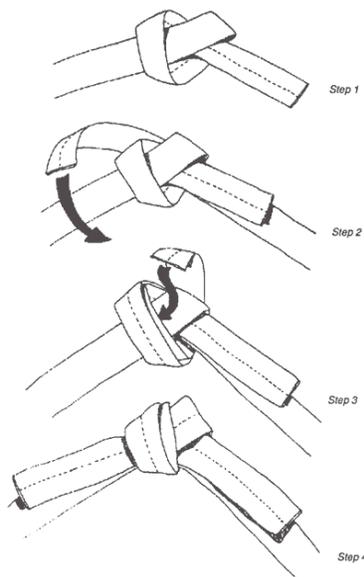
Knots

Knot tying is an essential part of climbing. Your safety and the safety of others depends on knowing how to tie knots correctly. Practice until you can tie these knots in the dark, on a glacier, with cold fingers and a rope-mate in a crevasse.

Overhand Knot: Fundamental knot, used frequently as a stopper knot. The double overhand (not shown) is used to finish a reweven figure eight knot. *Freedom of the Hills*, p. 155.



Water Knot: The water knot is used to attach webbing ends together. In the GCC we start the knot by tying an overhand knot in one of the ends. Then, using the other end, feed the rope back through the knot following the path of the first rope in reverse. Tails must be at least 3 inches long. *Freedom of the Hills*, p. 156.



Butterfly Knot: The butterfly knot (not to be confused with the butterfly coil) is utilized to secure the rope when using “climbing in coils”. See *Freedom of the Hills* p. 159, Figure 9-16 for another way to tie the butterfly knot.



Form three loops around your hand, with the 1st loop near your thumb, the 2nd loop over the fingers, and the 3rd loop in the middle.



Make loop #2 bigger...

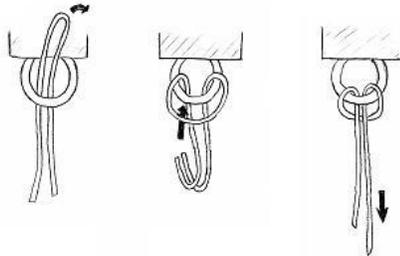


...and pass it over and behind the other two loops.

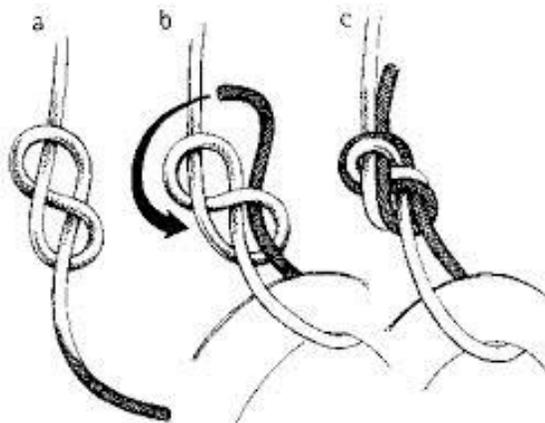


Remove your hand and dress the knot, cinching it tight.

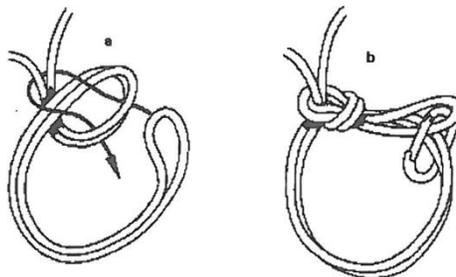
Girth Hitch: The girth hitch is used for quickly attaching a loop to any object. In the GCC a girth hitch is used to attach personal anchors to harnesses and webbing to haul loops. *Freedom of the Hills*, pp. 159-160.



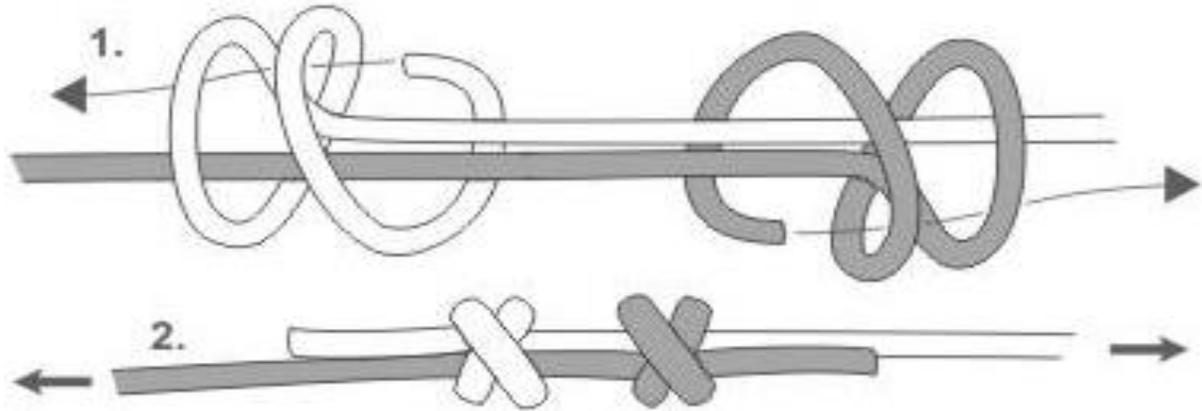
Rewoven Figure Eight: Climbers on the end of the rope tie into a seat harness with a rewoven figure eight, finished with a double overhand knot to secure the loose end. *Freedom of the Hills*, pp. 157-158.



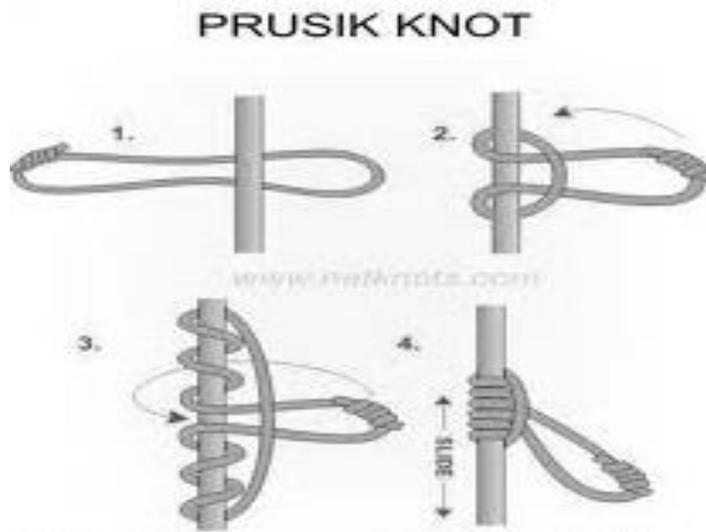
Double Bowline: Also known as a bowline (pronounced “boh-lunn”) on a bight. Climbers in the middle of the rope tie into a seat harness with a double bowline. The resulting end loop should be secured with a carabiner to the climber’s harness.



Double Fisherman's Knot: In the GCC we use the double fisherman's knot to tie hero loops and prusik loops. A "half double fisherman's knot" (also known as a double overhand knot or barrel knot) is used to finish a rewoven figure eight knot, and to secure the foot loops of a Texas prusik. *Freedom of the Hills*, p. 157.



Prusik Hitch: The prusik knot provides the climber with a means of ascending the climbing rope if they fall into a crevasse, or if self-belaying to a crevasse lip to check on a fallen climber. Under tension, the prusik knot grips the climbing rope; with the tension removed, the knot can easily be slipped along the rope. It is important that the prusik knot is correctly dressed. *Freedom of the Hills*, p. 161.



Daisy Chain: In the GCC we use a daisy chain to neatly bundle our runners to our harnesses. Runners need to be organized, quickly accessible, and out of the way of your feet. Accidents can happen when climbers trip on their own runners. *Freedom of the Hills*, p. 274, fig 14-8.

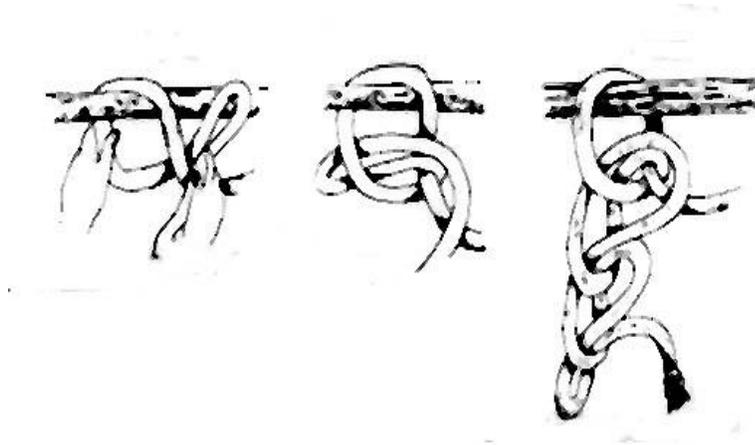
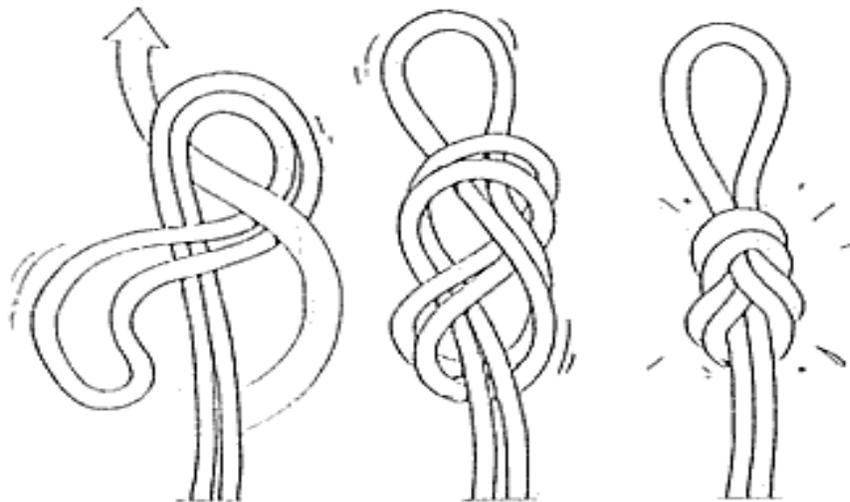


Figure Eight on a Bight: In the GCC we use a figure eight as a back-up knot during our C-pulley set-up. *Freedom of the Hills*, p. 157.



Full Tie-in Checklist

1. Harness waist belt correctly fed through buckle (That is, doubled back, except for buckles that are designed otherwise).
2. Rope tied to seat harness through both hard points of the harness (waist belt and crotch loop).
 - a. If tying in with a rewoven figure eight, finish the knot with a double overhand knot.
 - b. If tying in with a double bowline, clip the end loop to a harness gear loop using a regular carabiner.
3. Personal anchor girth-hitched through both hard points of the harness, with a regular carabiner and a locking carabiner on other end, both clipped to gear loop.
4. Locking carabiner clipped through belay loop.
5. Chest harness over shoulders and clipped in front with a regular carabiner.
6. Tie foot and harness prusiks onto rope.
 - a. Foot prusik in pocket or doubled up and clipped to a harness gear loop.
 - b. Harness prusik clipped to locking carabiner on belay loop (step #4).
7. Pulley and hero loop clipped together on locking carabiner on gear loop.
8. Belay device clipped to large pear-shaped carabiner on a gear loop.
9. Extra locking carabiner clipped to gear loop.
10. Two single runners clipped to a carabiner on a gear loop.
11. One double runner clipped to a carabiner on a gear loop.
12. One single runner girth-hitched to pack haul loop, and a carabiner clipped to it.

March

Seminar 2

Navigation and Climbing

Monday, March 4th – 6:00-8:30pm

Highlands Community Center - 14224 Bel-Red Rd, Bellevue, WA 98007

Field Trip 2

Navigation & Rope Skills

Saturday, March 9th – 8am-4pm

Mountaineers South Climbing Wall, Magnuson Park

7700 Sand Point Way NE

Seattle, WA 98115

Conditioner 2

Sign up on the OSAT Events Calendar

New Skills

Map competency

Compass components

Bearings

Plotting a bearing

Belaying

Rappelling

Prusiking

Rope coiling

Climbing commands

Seminar 2: Navigation and Climbing

Monday, March 4th – 6:00-8:30pm

Highlands Community Center - 14224 Bel-Red Rd, Bellevue, WA 98007

Goal: To review basic navigation and climbing concepts.

***Freedom of the Hills* required reading:**

Chapter 5 - Navigation – pp. 90–112, pp. 119–124

Chapter 9 - Basic Safety System – pp. 150–154

Chapter 10 - Belaying – pp. 172–179, pp. 181–184, p. 193, and pp. 197–198

Chapter 11 - Rappelling – pp. 203–206

Chapter 18 - Glacier Travel and Crevasse Rescue – pp. 390–399, pp. 415–416 (Shortening...)

Required equipment:

Syllabus

Freedom of the Hills

Full harness set-up

Day pack, with the Ten Essentials (including compass)

Rope remnant

What you will receive:

Mt. Rainier and Mt. Baker USGS maps

Field Trip 2: Navigation and Rope Skills

Saturday, March 9th – 8am-4pm

Mountaineers South Climbing Wall, Magnuson Park

Goal: To learn how and demonstrate finding, shooting, and following a bearing. Practice belaying, rappelling, and prusiking.

Required Reading:

1. *Freedom of the Hills*:
 - a. Ch. 9: Helmets, pp. 163-164
 - b. Ch. 10:
 - i. Belaying, pp. 172-182
 - ii. Communication, pp. 197-199
 - c. Ch. 11:
 - i. Rappel Method, pp. 211-214
 - ii. Rappel Technique, pp. 215-220
 - d. Ch. 18:
 - i. Inside the Crevasse, pp. 408-410
 - ii. Rescue Methods, pp. 410-414
2. GCC Syllabus 2019:
 - a. Belaying, p. 31
 - b. Setup for the extended rappel, pp. 32-33
 - c. Butterfly coil, p. 33
 - d. Climbing in coils, p. 34

What to bring:

1. **Completed take-home test from the Navigation seminar**
2. Syllabus
3. Ten Essentials including Compass
4. Mount Rainier and Mount Baker USGS Maps
5. Large Ziploc bag
6. Pencil (NOT a pen; to use for triangulation problems)
7. Full personal harness set-up
8. Helmet
9. Belay gloves
10. Rope remnant
11. Warm clothes
12. Rain gear
13. Snacks and/or lunch
14. Foam sit pad (optional)

March Study Questions

1) Describe how the following contour lines are displayed on a topographical map:

Steep slopes:

Gullies:

Spurs or ridges:

Peaks:

Saddles:

2) Compass questions:

What is the term for the east/west measurement around the globe?

What is the term for the north/south measurement around the globe?

The round dial of a compass is divided into _____ degrees.

At which bearing (in degrees) is: North _____? South _____? East _____? West _____?

What is an adjustable declination arrow?

3) Discuss benefits and disadvantages of GPS (global positioning system) devices?

4) What three things are necessary to make a belay system work?

1.

2.

3.

5) What is impact force?

6) What does PBUS stand for?

7) Explain how the GCC-recommended belay device works.

8) List the four elements of a rappel system.

1.

2.

3.

4.

9) What is "climbing in coils", and why is it used?

Belaying

Setting the Belay Up: Clip a pear-shaped locking carabiner to your belay loop. Clip the belay device into this carabiner. Take a bight of rope and thread it through the belay device; the side of the rope going to the climber should be on the side of the belay device without teeth, and the loose end of the rope will run across the teeth into your brake hand.

Before beginning to climb, both climber and belayer should check each other to make sure they are tied-in appropriately. Once the belay is set up, you will be using the “PBUS” (pronounced “P-bus”) method described below.

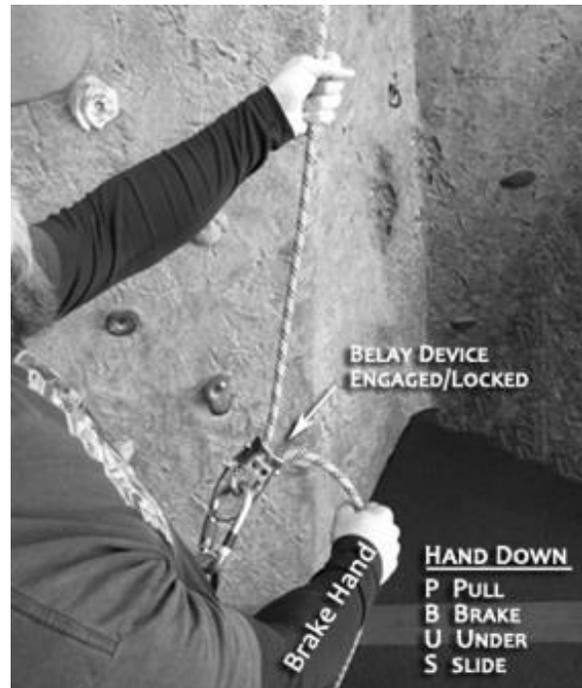
Climbing commands:

Before beginning to climb,

1. Climber will ask the belayer “On belay?”
2. When belayer is ready, they will respond “Belay is on.”
3. When the climber is ready, they will announce “Climbing.”
4. Belayer, if ready, will respond “Climb on.”

PBUS (Pull – Brake – Under – Slide)

1. The *brake hand* should be holding the rope using an overhand grip; the *feeling hand* holds the rope to the climber an arm’s length away (see photo).
2. As climber ascends, belayer will **PULL** slack through the belay device to keep the rope to the climber taut.
3. Once the feeling hand reaches the belay device, the brake hand will move into **BRAKE** position (with rope being pulled tightly downward across the teeth of the belay device).
4. Release the feeling hand, reaching **UNDER** the brake hand, and grasp the rope.
5. **SLIDE** the brake hand towards the belay device.
6. The feeling hand then returns to the climber’s strand of rope as in step 1.
7. Repeat steps 1 through 6.
8. When climber reaches anchor, climber will clip in with personal anchor and say “Off belay.”
9. Belayer will remove rope from belay device, then say “Belay is off.”



YOUR BRAKE HAND MUST NEVER LET GO OF THE ROPE!

Extended Rappel, with Autoblock

Watch <http://bit.ly/extendedRappel>



Step 1: To safely secure yourself to the anchor while you set up the rappel, clip a locking carabiner from the end of the Personal Anchor System (PAS) to the rappel anchor, avoiding twists in the PAS. Lock the carabiner's gate. (Then untie from the climbing rope, if you were tied in.)



Step 2: Clip your pear-shaped carabiner (along with your rappel device) so that it is clipped through the 2nd and 3rd loops of the PAS-22, as shown in the picture, with the device facing away from you and the teeth downward.



Step 3: Push a bight of each strand of the rappel rope through the slots in the belay device. The strands going down to the braking hand must run through the side of the belay device with "teeth". Then clip both loops of the rope with the pear-shaped carabiner and lock it.



Step 4: Clip your hero loop into a third locking carabiner on your belay loop. Adjust the hero loop so that the knot is near the carabiner. Take both strands of rappel rope below the belay device and wrap the hero loop around both strands of the rope three or more times, creating an "autoblock" (see FotH fig 9-25, p. 163). Clip the end of the hero loop back into the locking carabiner and lock it.

Note: This will leave the autoblock positioned in a central and secure location well below the rappel device.

Step 5: Now that the rappel is set up, we will test the rappel. While still connected to the anchor, slide both strands of the rappel rope through the belay device until it is next to the rappel anchor. This should create slack in your personal anchor. Next, slide the autoblock further up the rappel rope towards the belay device. At this point you must weight the autoblock while there is slack in your personal anchor to ensure that it is holding your weight.



Step 6: When ready to rappel, yell “ON RAPPEL!” down to anyone below you. This lets them know that you are coming down and that they need to be aware in case you knock a rock loose, etc. Then you can unclip from the anchor and clip the carabiner back to your belay loop (see left). You will need to manage the autoblock as you rappel, with one hand on the rappel rope at all times.

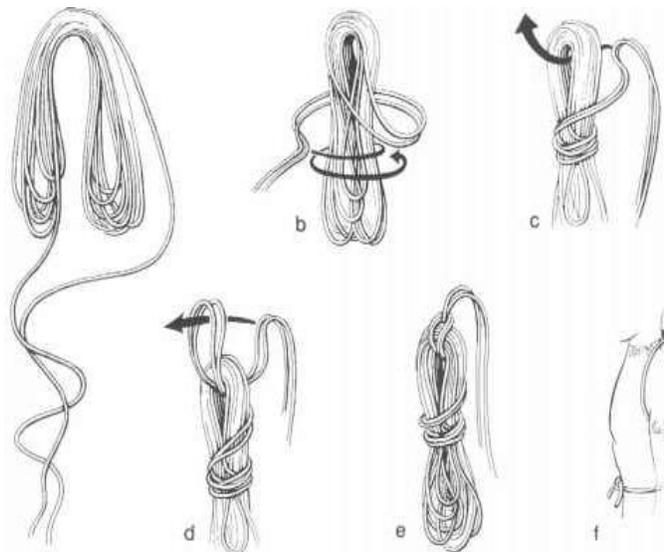
Note: If you are using a personal anchor system such as the Metolius PAS, be sure to clip through two of the sewn loops to ensure redundancy.

Butterfly Coil

Freedom of the Hills pp. 153-154

For carrying or storing, the rope is normally coiled in the butterfly coil (also called the mountaineer’s coil). Usually faster to coil and uncoil, the butterfly coil does not kink the rope.

1. Coil the rope leaving both ends long
2. Bend the coil into a horseshoe shape (a)
3. Wrap both loose ends around the middle of the coil several times (b)
4. Bring loop of loose ends through upper loop of coil (c)
5. Bring loose ends through loop of loose ends (d)
6. Bring loose ends all the way through and cinch (e)



Climbing in Coils (a.k.a. the Kiwi Coil)

Freedom of the Hills pp. 415-417, "Shortening the Rope with Coils"

Watch: <http://bit.ly/tyingAKiwiCoil>

This technique results in closer spacing between rope partners for more efficient, comfortable travel, and it provides some free rope for a hauling system or other rescue use.

1. Tie in to the rope at your seat harness as you would normally.
2. Take a series of coils of rope into your hand (usually five, but no more than nine) until you have the desired spacing between you and your rope partner. (These coils will likely be thrown over your shoulder and head as in the picture, so make sure the coils are large enough to fit around your body.)
3. Once the coils are over your shoulder, secure the coils together by tying an overhand knot around them, using a loop of the rope.
4. Clip a carabiner to the loop of the rope and secure to coils.
5. Tie the shortened length of climbing rope to your seat harness with a butterfly knot. The rope is now tied twice to the seat harness, and any force coming onto the rope will be taken by this second knot.



April

Seminar 3

Ice Axe and Glacier Travel

Monday, April 1st – 6:00-8:30pm

Highlands Community Center - 14224 Bel-Red Rd, Bellevue, WA 98007

Field Trip 3

Ice Axe and C-Pulley

Saturday, April 6th – 8am-4pm

OR Saturday, April 13th – 8am-4pm

Summit East, Snoqualmie Pass (or alternate)

Conditioner 3

Mt. Si Time Trial - sign up on the OSAT Events Calendar

New Skills

Introduction to snow travel

Ice axe arrest

Self-belay

Glissading

Plunge stepping

Avalanche awareness

C-Pulley

Anchors

Seminar 3: Ice Axe and Glacier Travel

Monday, April 1st – 6:00-8:30pm

Highlands Community Center - 14224 Bel-Red Rd, Bellevue, WA 98007

Goal: To understand the basics of using an ice axe and provide a brief overview of glacier travel.

***Freedom of the Hills* required reading:**

Chapter 6 - Wilderness Travel – pp. 128–132

Chapter 16 - Snow Travel and Climbing – pp. 330–337, pp.339–355, and pp.360–365

Chapter 18 - Glacier Travel and Crevasse Rescue – pp. 400–418

Required equipment:

Syllabus

Freedom of the Hills

Full harness set-up

Day Pack, with the Ten Essentials

Rope Remnant

Ice Axe

Field Trip 3: Ice Axe, and C-Pulley

Saturday, April 6th – 8am-4pm

OR Saturday, April 13th – 8am-4pm

Location: Summit East (or alternate)

Goal: To become familiar and comfortable with performing each self-arrest position, and to be able to effectively place anchors for the C-pulley.

Note from your Field Trips Chair: This is an all-day field trip. Please choose only one of the field trip date options on the OSAT activities calendar.

Required Reading:

1. GCC Syllabus 2019:
 - a. Self-arrest, p. 40
 - b. Self-belay, p. 40
 - c. Glissading, p. 41
 - d. Plunge-stepping, p. 41

What to bring:

1. Syllabus
2. Backpack, with the Ten Essentials
3. Full personal harness set-up
4. Ice axe
5. Helmet
6. Full set of rain gear
7. Waterproof gloves
8. Waterproof gaiters
9. Foam sit-pad
10. Additional warm clothes (in case you get cold and wet)
11. Snacks and lunch
12. Dry clothes in the car to wear home

April Study Questions

- 1) Name the five parts of an ice axe.
- 2) Explain self-arrest and why it is so important in glacier travel.
- 3) What type of glissading do we use in the GCC?
- 4) What are the four positions a falling climber must know how to self-arrest from?
- 5) What is the most effective self-arrest position?
- 6) What do you do if you lose your axe in a fall?
- 7) What is a picket?
- 8) What does a snow anchor's strength depend on?
- 9) In a climbing party, whose responsibility is it to yell "falling", when needed?
- 10) What is a deadman anchor?
- 11) What is the plunge step? When do you use it?
- 12) Why should you practice with your crampons before needing them?
- 13) What is the purpose of the rest step?
- 14) In a rescue scenario, what knot is used after both anchors are built to back up the rope to the fallen climber?
- 15) Where do you pack the heaviest items in your pack?
- 16) List the seven points for safe snow travel:

Time Trial: Mt. Si

Time trials are designed to expose you to the rigors of a climb and make sure that you are developing the fitness level to be able to climb safely.

In April, you will be required to climb to the top of Mount Si carrying a 30 lb. pack in two and a half hours or less and make it back to the car in another two hours. The time trial will occur on the Old Mt. Si Trail.

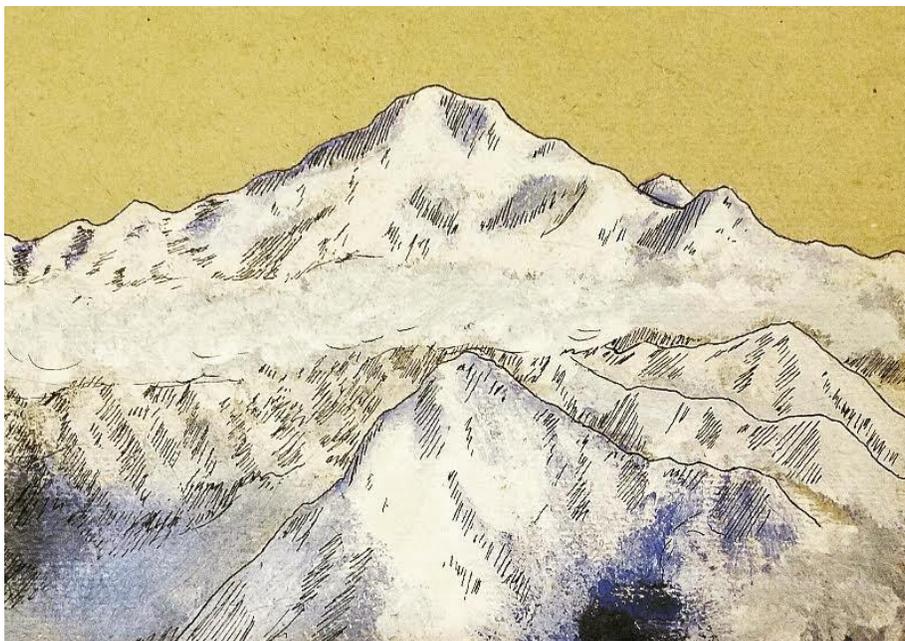
Please be courteous and respectful to instructors that are volunteering their time to teach. Be respectful of your classmates; dangerous and disrespectful behavior may result in dismissal from the course at the discretion of the GCC Committee.

It is required that:

- All participants are prepared and on time.
- All participants register with the conditioner leader and provide emergency contact information.
- Participants adhere to all GCC Conditioner Policies and wilderness regulations.

It is recommended that:

- The student has completed the Old Mt. Si Trail prior to the time trial.
- The student has completed a 2000-ft gain (or more) hike with a 30 lb. pack prior to the time trial.



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Self-Arrest

Freedom of the Hills – pp. 349–353

Self-arrest is one of the most important skills you will learn in the Glacier Climbing Course!

Self-arrest technique holds a climber's fall or the fall of a rope-mate. During glacier travel, self-arrest stops the rest of the team from sliding into a crevasse.

For all positions once on your stomach with your head uphill:

1. Press the pick into the snow just above your shoulder. Place the adze near the angle formed by your neck and shoulder. This is crucial. Sufficient force cannot be exerted on the pick if the adze is not in the proper position.
2. Place the shaft across your chest diagonally. Hold the spike end close to the hip that is opposite the axe head. Grip the shaft near the spike end.
3. Press your chest and shoulder down on the ice axe shaft. Successful self-arrest relies on your body weight falling and pressing on the axe.
4. Keep your head face down.
5. Arch your spine slightly away from the snow. This places the bulk of your weight on the axe head. Pull up on the spike end of the shaft, which starts the arch and rolls your weight toward your shoulder by the axe head.
6. Bend your knees slightly. Place them against the surface to slow the fall in soft snow.
7. Once you have come to a stop, dig your toes into the snow.



Note: If you are wearing crampons - lift your feet off the ground while in motion as your crampon may catch and flip you over or break an ankle. Once you come to a stop, you will want to dig your toes into the snow.

Self-Belay

Freedom of the Hills – p. 349

Self-belay is a technique that is helpful in *preventing* a fall on steep snow slopes as well as ascending a steep slope directly (instead of diagonally). To self-belay, be sure both feet are secure and square to the slope, then jam the spike and shaft of the ice axe straight down into the snow. Place both hands on top of the ice axe as demonstrated in the photo to right. Then kick one or two steps, digging toes at a slight downward angle into the slope. Firmly plant feet before repeating the process.



Glissading

Freedom of the Hills – pp. 347-348

Glissading is one of the joyous bonuses of mountain climbing, offering the fastest, easiest, and most exhilarating way down many snow slopes for a climber on foot. It's an alternative to walking or plunge-stepping, for use on slopes where you can keep your speed under control.

Sit erect in the snow and bend your knees. Hold your ice axe in self arrest position. Turn your hand so that you continue holding the axe in self-arrest position, but are now waving at yourself. Your pinky finger should be over the pick of your axe. If you are holding the ice axe with your right hand, run the spike of the axe along the left side of your body. If you are holding the ice axe in your left hand, run the spike of the axe along the right side of your body. Place your other hand on the shaft of the axe as you run the spike of the axe like a rudder along the snow. This will help maintain control. To stop, dig the spike in further to slow yourself down. If you lose control during a glissade, roll over and self-arrest. If you are holding the head of the axe with your right hand, you will roll to the right and vice versa for the left. Be sure to wear gloves and rain pants.



Plunge-Stepping

Freedom of the Hills – p. 346

Plunge-stepping is a simple way of descending a snow slope. It is done by firmly planting your heel into the snow with toes pointing upward. Don't try to jump or drop - simply step forward and let gravity pull you toward your next step. Your leg should be firm to resist the upward force of the slope to your foot, but avoid locking the knee to minimize injury.

Drive the spike of the axe into the snow with each step. This will greatly help your stability, and also help you to self-arrest if you end up falling. Be careful not to step too aggressively, especially in soft snow, where you have the potential of getting stuck. Always adjust your downward force to the conditions. Also, when the snow is much harder, you'll want to adjust to a harder step to ensure traction on the snow surface.



May

Seminar 4

Snow Camping and Roped Travel

Midterm Exam

Monday, May 6th – 6:00-8:30pm

Highlands Community Center - 14224 Bel-Red Rd, Bellevue, WA 98007

Field Trip 4

Glacier Travel

May 18th, 8:00am – May 19th, 5:00pm

Stevens Pass (or alternate)

Conditioner 4

Camp Muir Time Trial - sign up on the OSAT Events Calendar

New Skills

Snow camping

Roped travel

Group arrest

Carabiner-Ice Axe belay

Ice Axe-Boot belay

Standing Hip belay

Sitting Hip belay

Anchors

Running belay

Fixed lines

C-Pulley

Alpine starts

Nutrition

Seminar 4: Snow Camping and Roped Travel

Monday, May 6th – 6:00-8:30pm

Highlands Community Center - 14224 Bel-Red Rd, Bellevue, WA 98007

Goal: To review snow camping, roped travel, and equipment needs. The midterm exam will be given during this seminar.

***Freedom of the Hills* required reading:**

Chapter 3 - Camping, Food and Water – pp. 46–53, pp. 58–59 and pp. 64–78

Chapter 24 - First Aid - Entire Chapter

Required equipment:

Syllabus

Freedom of the Hills

Full harness set-up

Day pack, with the Ten Essentials

Rope Remnant

Pen and test taking material

Field Trip 4: Glacier Travel

May 18th, 8:00am – May 19th, 5:00pm

Stevens Pass or alternate

Goal: Experience snow camping and experiment with clothing, sleeping, and food systems. Demonstrate effective rope management and team travel skills.

This is an overnight trip with two very full days of learning skills. Make sure you have prepared and packed in advance, so you are **ready to go at 8:00 AM sharp** in the parking lot.

Required Reading:

1. *Freedom of the Hills*:
 - a. Ch. 24: First Aid - entire chapter
2. GCC Syllabus 2019:
 - a. Snow camping checklist, p. 47
 - b. Carabiner ice-axe belay, p. 48
 - c. Ice-axe boot belay, p. 48
 - d. Standing hip belay, p. 49
 - e. Sitting hip belay, p. 49
 - f. Snow anchors, p. 50
 - i. Standard picket anchor
 - ii. Deadman anchor
 - g. Running belay, p. 51
 - h. Fixed lines, p. 51
 - i. The Law of Light, pp. 59-60

Tips:

1. Double check all your gear and plan out your food and clothing needs carefully.
2. Use this field trip as a practice run for the next three overnight trips. These trips will have a much longer approach hike where your food and clothing needs should be more dialed-in.
3. When you get home, write down what worked and what didn't so next time you are better equipped.

What to Bring:

1. See the snow camping checklist on page 47 of the syllabus.
2. Ask a mentor for food tips and packing tricks.

May Study Questions

- 1) What is AMS and what are its symptoms?
- 2) List four ways to prevent hypothermia:
 - 1.
 - 2.
 - 3.
 - 4.
- 3) What are the four stages of core cooling?
 - 1.
 - 2.
 - 3.
 - 4.
- 4) What is the best thing to do about a hot spot?
- 5) How do you prevent snow blindness?
- 6) What is the first thing you do when you hear “FALLING!” on a climb?
- 7) List three absolutes about anchors during a crevasse rescue.
 - 1.
 - 2.
 - 3.
- 8) What is important about the lip of a crevasse—no matter the rescue method?
- 9) Why do you drop your pack in a crevasse?
- 10) Explain the importance of good communication during a rescue.
- 11) List the pieces of gear we carry for the C-pulley.
- 12) Besides crevasses, what are some other common glacier travel hazards?
- 13) Explain the stewardship requirement for all GCC students.
- 14) What is the advantage of pressurized canister fuel for your stove in the mountains?
- 15) Explain the purpose of digging a pit in the snow at your tent opening.

Snow Camping Checklist

- Backpack and pack cover
- Full personal harness set-up
- Ten Essentials (including illumination and extra batteries!)
- Ice axe, with leash
- Helmet
- Boots (crampon-compatible)
- Crampons
- Insulating clothing layers and accessories
- Rain gear
- Camp clothing and footwear (optional)
- Sun protection including glacier glasses or goggles, and sunblock.
- Food: 2 lunches, 1 dinner, 1 breakfast, energy snacks, snacks to share.
- Eating utensils (bowl, cup, fork/spork/spoon)
- Hydration bladder and/or water bottle(s)
- Foam sit pad
- Tent
- Sleeping bag and sleeping pad(s)
- Stove and fuel
- Water filter
- Snow shovel
- "Blue bags", toilet paper, hand sanitizer.
- Hand warmers (as needed)
- Personal items: toiletries, medications, lip balm, etc.
- Dry clothes to wear home

Carabiner-Ice Axe Belay

Freedom of the Hills pp. 358-359

Watch: <http://bit.ly/CarabinerIceAxeBelay>

Also called the stomper belay, the carabiner-ice axe belay provides better security than a boot-axe belay (see below), with easier rope handling. One good thing about the carabiner-ice axe belay is that the force of a fall pulls the belayer more firmly into the stance.

1. Girth-hitch a short runner to shaft of the axe just below the head.
2. Attach a carabiner to the runner.
3. Plant the axe in the snow perpendicular to the fall line.
4. Stand on the runner with your uphill foot.
5. Run the rope up through the carabiner.
6. Wrap the rope around the back of your waist into your uphill hand. Your uphill hand will be the brake hand, never to leave the rope.
7. As climber ascends, pull rope with both hands as shown in the illustration. When your downhill hand reaches your body, let go and grab the rope beyond your brake hand. Slide the brake hand close to body. Regrip the rope with your downhill hand and repeat.
8. If the climber slips or falls, pull the rope across your midsection with brake hand to arrest climber's fall.



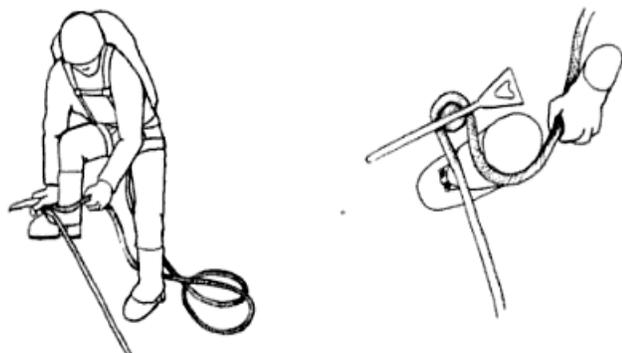
Ice Axe-Boot Belay

Freedom of the Hills p. 359

Watch: <http://bit.ly/IceAxeBootBelay>

The boot-axe belay is a fast and easy way to provide protection as a rope team moves up together. The boot-axe belay cannot hold the force of a high fall from above the belay, and because of the belayer's hunched over stance, rope management is difficult. The boot-axe belay may be used when protecting a rope mate who is probing a cornice or crevasse edge or when providing a top belay.

1. Sweep the rope around the shaft of the ice axe near the head.
2. Plant your uphill foot.
3. Dig the ice axe into the ground on the uphill side of your foot, ensuring that the rope runs over the top of your boot.
4. Wrap the rope around your ankle.



Standing Hip Belay

Freedom of the Hills pp. 183-184
Watch: <http://bit.ly/standingHipBelay>

The hip belay (or body belay) is a belay method in which the rope is wrapped around the belayer's body to generate enough friction to stop a climber's fall. The belayer assumes a stable stance sideways with downhill foot towards the direction of an anticipated pull on the rope. The rope from the climber is passed around the belayer's back, just below the top of the hips. To arrest a fall, pull your braking arm across the stomach.

Because the force of a fall is dissipated as friction against the belayer's body, a belayer stopping a severe fall can suffer serious rope burns. Gloves are essential to protect the hands from burns. With the hip belay, the belayer can take in rope much faster than with other methods and the hip belay can be set up quickly with a minimum of equipment.

Sitting Hip Belay

Freedom of the Hills p. 360
Watch: <http://bit.ly/sittingHipBelay>

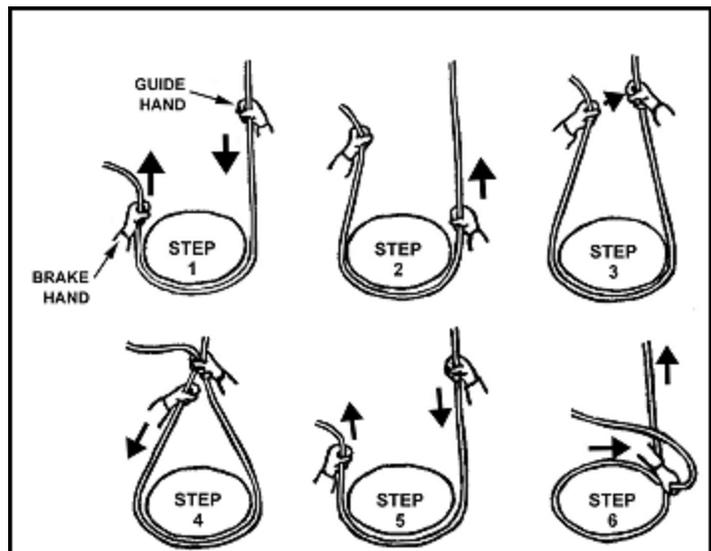
Used with a snow anchor, the sitting hip belay is dynamic and secure on snow. It does have its drawbacks. The sitting belayer may face the prospect of a cold and wet assignment, and the belay can be difficult to work if the rope is frozen.

1. Stomp a seat in the snow as well as a platform to brace each boot against.
2. Place a foam pad or other material as insulation from the snow.
3. Settle into a seated position with legs outstretched.



Braking

1. Grasping the rope with both hands, place it behind the back and around the hips. The hand on the section of rope between the belayer and the climber would be the guide hand. The other hand is the brake hand.
2. Take in rope with the brake hand until the arm is fully extended. The guide hand can also help to pull in the rope (Step 1).
3. Holding the rope in the brake hand, slide the guide hand out, extending the arm so the guide hand is farther away from the body than the brake hand (Step 2).
4. Grasp both parts of the rope, to the front of the brake hand, with the guide hand (Step 3).
5. Slide the brake hand back towards the body (Step 4).
6. Repeat step 5. The brake can be applied at any moment during the procedure. It is applied by wrapping the rope around the front of the hips while increasing grip with the brake hand (Step 6).



Snow Anchors

Snow anchors provide protection and secure rappels and belays. The strength of a snow anchor placement depends on the strength of the snow. The greater the area of snow the anchor pulls against and the firmer the snow, the stronger the anchor. Ultimately the strength of snow anchors depends greatly on proper placement and snow conditions. Common snow anchors are pickets, deadman anchors, flukes, and bollards.

Standard Picket Anchor

Freedom of the Hills – pp. 355-356

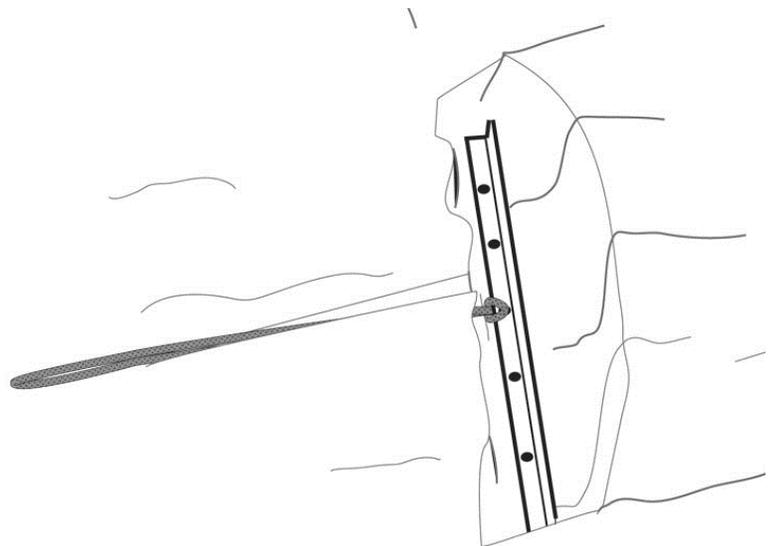
A picket is a stake driven into the snow as an anchor. The angle for placing a picket depends on the angle of the snow slope. The picket should be placed so that it can withstand the direction of pull while having the greatest possible area of snow to pull against. On a gentler slope, the placement should be vertical or at an angle of a few degrees toward the top of the slope. On a steeper slope, the placement should be at an angle of 45 degrees from the direction of the pull. Attach a carabiner or runner to the picket at the level of the snow surface. Drive a picket into the snow with a rock, the side of an ice axe, or an ice hammer. A picket works best in firm, hard snow. If the snow is too soft, use the picket as a deadman anchor.

Deadman Anchor

Freedom of the Hills – pp. 356-357

A deadman anchor is any object buried in the snow as a point of attachment for the rope. Ice axes, ice tools, and pickets can be used as deadman anchors.

1. Dig a trench the length of the item being used and perpendicular to the load. The depth should be as deep as the snow conditions require.
2. Girth hitch a runner to the item at its midpoint and place the item in the trench.
3. Cut a slot in the snow that is as deep as the trench to allow the runner to lie in the direction of the pull (your trench will now be T-shaped).
4. Do not disturb snow in front of deadman anchor.
5. To compact anchor into place, use snow from above deadman anchor and stomp into trench, burying the picket. Make sure everything is covered with snow and compacted except the tail of the runner.
6. Before using the deadman, you will want to test it. Clip into the runner and lean back with your whole weight on the anchor.



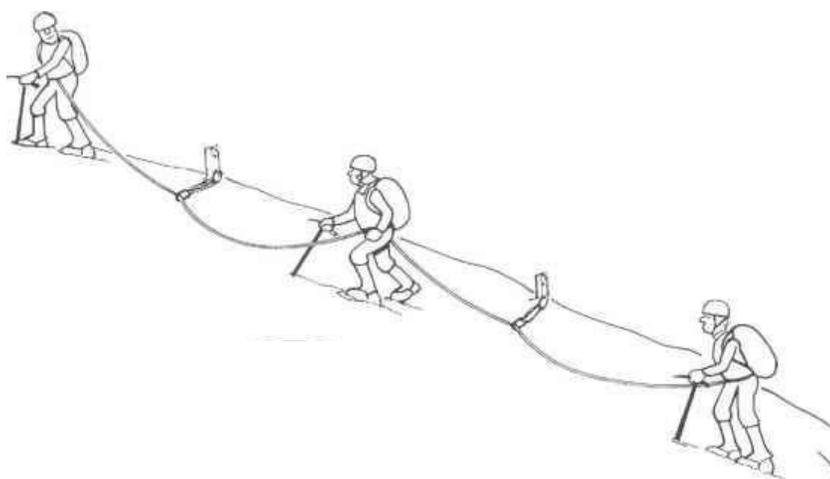
Running Belay

Freedom of the Hills – p. 355

Watch: <http://bit.ly/runningBelayInSnow>

Roped climbers can move together on snow with the help of running belays. This technique saves time over regular belayed climbing but still allows for protection. The running belay offers intermediate level of protection, somewhere between team arrest and fixed belays. Running protection may do the job on long snow faces and couloirs.

To set up a running belay, the rope lead will be carrying multiple pickets, each with a runner girth-hitched to the top hole and a carabiner clipped to the runner. The rope lead will pound a picket into the snow (see standard picket anchor above) and clip the carabiner-on-runner to the rope. Rope lead will continue climbing and set multiple pickets this way (see picture below). Subsequent climbers must pass picket safely, without unclipping from anchor. We will practice this technique during field trips.



Fixed Lines

Freedom of the Hills – pp. 473-477

A fixed line is a rope that is anchored and left in place on the route. It allows safe, quick travel up and down a difficult stretch. Fixed lines are common on long stretches of exposed climbing i.e. on the Disappointment Cleaver. We will practice ascending fixed lines using our personal anchor.

1. Girth hitch your personal anchor through both hard points of the harness.
2. Attach one locking and one non-locking carabiner to the other end of the personal anchor (stored on your gear loops when not in use). Your locking carabiner should NOT be an autolocking carabiner.
3. As you approach the fixed line, attach one carabiner to the rope so that your personal anchor is now attached to the fixed line.
4. When you reach an anchor point and need to pass your carabiner to the other side of the anchor, first attach the second carabiner that is not in use above the anchor point.
5. Then, unclip the carabiner that is attached below the anchor and continue moving through the fixed line.



Time Trial: Camp Muir

Goal: To reach 10,100 feet at Camp Muir in five hours or less.

You must pass this time trial in order to proceed in the GCC. These trials are designed to expose you to the rigors of a climb and make sure that you are developing the fitness level to climb safely.

Camp Muir time trials:

- **SIGN UP** on the calendar. If you are not able to attend, communicate with the leader as soon as possible. Please be respectful of everyone's time and your classmates' need to complete this task.
- **PLAN** more than enough time to reach the Paradise parking lot on Mount Rainier. Minimum three hours from Seattle.
- **BE PREPARED** when you get to the parking lot so we may all start on time.
 - You will need to have a national park permit. Remind other carpool mates in the event they have one already or if all will need to pitch in to purchase a day pass.
- **CARPOOL** for safety. It is a long drive and you will be tired after a full day on the mountain. Keep each other vigilant.
 - We usually stop for a meal (and coffee) together on the way home. This is a long day so please advise family members that you may not be able to contact them by phone until 9pm and sometimes home much later.
- **DOUBLE-CHECK** your glacier climbing equipment list and review recommended pages from Freedom of the Hills. You will learn something new every time and begin incorporating the wisdom into your mountaineering habits and behaviors.
 - Headaches at altitude are frequently found to be caused by dehydration rather than altitude sickness. Bring adequate hydration (and snacks) for a five-hour climb to Camp Muir and three hours back down.
 - There is no weight requirement for this climb, but you **MUST** bring your ten essentials. It might also be necessary to bring snowshoes, or other gear; your climb leader will keep you up to date.

Camp Muir: Get Your Bearings

Mount Rainier National Park

National Park Service
U.S. Department of the Interior



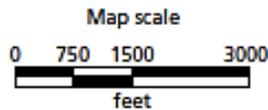
Get Your Bearings

Mistakes in navigation while traveling to or from Camp Muir during storms and "white-outs" have resulted in lost climbers and hikers and fatalities. To decrease the possibility of this happening to your party, this map shows compass bearings to and from Camp Muir (true and magnetic north) as well as the coordinates (latitude/longitude) of landmarks along the route. This map will not substitute for a USGS topographic map.

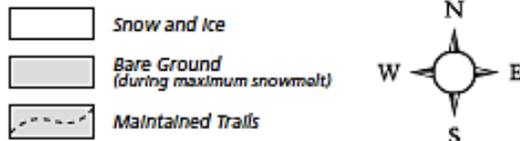
Proper bearings alone will not ensure a safe trip. Camp Muir and the Muir Snowfield are nearly surrounded by glaciers: the Nisqually Glacier to the west, the Cowlitz Glacier to the north and east, and the Paradise Glacier to the south and east. A minor error in navigation may lead you onto these glaciers where there are numerous crevasses and other hazards. Stay on course. You may have to correct your direction of travel to the windward due to strong winds, usually out of the west or southwest.

Always beware of steep cliffs to the east of Camp Muir and Anvil Rock and to the east of McClure Rock. These cliffs, obscured by snow and cornices in the winter, have been the sites of mountaineering tragedies. Panorama Point is a dangerous avalanche area.

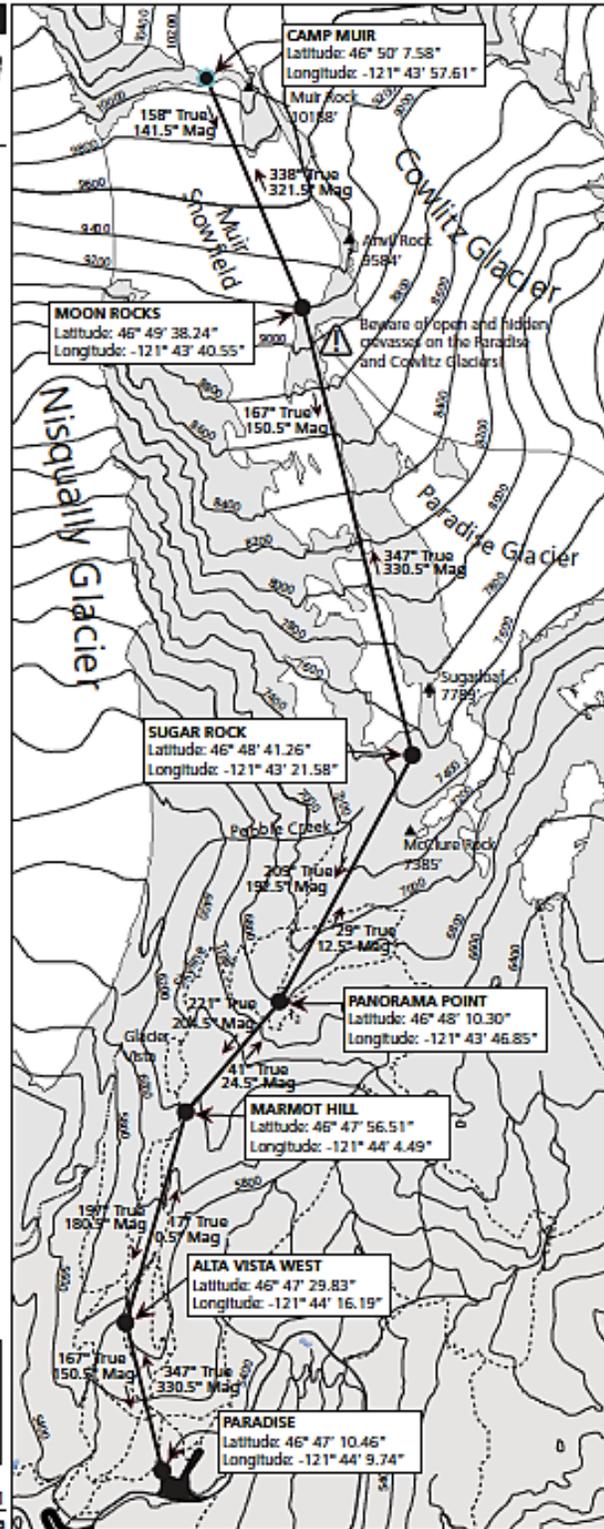
While traversing the Muir Snowfield, approach rock islands with care because of holes which form around rocks as snow melts. Crevasses occasionally open up on the snowfield in the vicinity of Anvil Rock in late summer and may be hidden by snow.



Contour interval: 200 feet
Magnetic declination: 16.5° East
GPS datum: WGS84



GPS coordinates (latitude/longitude) are provided in degrees/minutes/seconds (DMS) and use WGS84 datum. GPS units must use correct configuration, including projection and datum, for results to be accurate. Serious errors will occur if GPS units are not configured correctly!



June

Seminar 5

Preparing for Climbs

Monday, June 3rd – 6:00pm-8:30pm

Highlands Community Center – 14224 Bel-Red Rd, Bellevue, WA 98007

Field Trip 5

C-Pulley Practice

Wednesday, June 5th – 6pm-8:30pm

Gas Works Park 2101 N Northlake Way, Seattle

Field Trip 6

Crevasse Rescue

June 8th, 8:00 am – June 9th, 5:00pm

Mount Baker, Easton Glacier

Mt. Baker National Recreation Area and Wilderness

New Skills

Full C-pulley rescue

Team self-rescue

Packing light

Complete your first glacier climb!

Seminar 5: Preparing for Climbs

Monday, June 3rd – 6:00pm-8:30pm

Highlands Community Center – 14224 Bel-Red Rd, Bellevue, WA 98007

Goal: Discuss signing up for climbs and giving back in the GCC.

Required Reading:

1. GCC Syllabus 2019:
 - a. Glacier Climb and Policies, pp. 61-62
 - b. Routes on Rainier, p. 63
 - c. You Can Be a Porter & Giving Back, p. 64

Review Readings:

1. Chapter 18 - Glacier Travel and Crevasse Rescue
2. GCC Syllabus 2019 – The Law of Light, pp. 59-60

Required Equipment:

Freedom of the Hills

Full harness set-up

Day pack, including the Ten Essentials

Syllabus

Rope remnant

Field Trip 5: C-Pulley Practice

Wednesday, June 5th – 6pm-8:30pm
Gas Works Park, 2101 N Northlake Way, Seattle

Goal: To complete full C-pulley set-up from each rope position with no guide.

Review:

C-Pulley hand-outs

What to Bring:

1. Syllabus
2. Day pack, including the Ten Essentials
3. Full personal harness set-up
4. Rope remnant
5. Ice axe
6. Rain gear
7. Helmet
8. Foam sit pad



©Lindsey Koon

Field Trip 6: Crevasse Rescue

June 8th-9th

Mount Baker, Easton Glacier

Mt. Baker National Recreation Area and Wilderness

Goal: To refine critical course skills in preparation for graduation climbs.

What to bring: Follow Snow Camping Checklist, p. 47.

What to consider:

1. We will be traveling as a large group; if you consider yourself a fast hiker, please prepare yourself to hike at a slower, group pace.
2. The importance of Leave no Trace, especially when traveling in a large group:
 - a. Be considerate of others
 - b. Pack it in, pack it out
 - c. Camp on durable surfaces
3. Parking is limited and carpooling is strongly recommended. Be sure to have the proper parking pass available.
4. Cell service is limited close to the trailhead; ensure you have proper offline directions available.

Group Equipment: Instructors will assist in coordinating group equipment and students should be prepared to help carry the following group gear to camp:

1. Pickets
2. Ropes

The Law of Light

by Mike Stuckey

Of all the things you can control to make your climbs more enjoyable and successful, the two most important are conditioning and pack weight. Follow advice from your leaders and elsewhere in this syllabus to maximize your conditioning.

When it comes to your pack weight, follow the LAW of Light!

To truly be successful at lightening your pack, you must LIST AND WEIGH everything you will carry on your back, hence “The LAW of Light.” This may sound obvious and simple but few climbers ever actually do it thoroughly. Many people will spend a lot of money buying the lightest sleeping bag, tent and jacket yet they will never weigh their food or repair items.

Others will use a bathroom scale, first standing on it without their pack and then with their pack to get what is only a rough estimate of the pack’s weight. If you want to shave pounds from your pack, you need to start with ounces. To shave ounces, you need to be much more thorough and accurate.

To begin, make a list of all the gear that you might ever take on a climb, starting with the pack itself. If you have duplicates, list them all. On some items, it’s fine to list them as a group, such as your first aid kit or “sleeping bag and stuff sack.”

Once you have the list, weigh everything, including the food and water you plan to carry. Do this with digital food and/or fish scales. These are very accurate. Food scales usually handle items up to 10 pounds or so; fish scales generally go to 50. Both are available for around \$25. You can often borrow them or share the cost with friends.

When you have all of the items weighed and noted, you can begin to make truly informed decisions about what to take and what to leave, depending on the nature of the climb. You can also split up group gear more efficiently and fairly.

For the GCC’s two-day Baker climbs, student packs should really weigh no more than 35 to 40 pounds without ropes or pickets. For three-day Rainier climbs, 40 to 45. And it is possible to make those climbs with even less weight and still be comfortable. The snow camping and crevasse rescue field trips should allow you to get a feel for what is essential and what is a luxury.

(cont. – The Law of Light)

There are three areas where many novice climbers should focus to reduce weight:

FOOD: Plan every meal very carefully, including snacks. Know exactly what you will eat and when. Do NOT just pack “at large” bags of trail mix and granola. Do NOT bring extra entire Mountain House meals so you can decide what you actually want when mealtime arrives. For Baker, bring Snack 1, Lunch 1, Dinner 1, Breakfast 1, Snack 2 and Lunch 2. Use a similar strategy to plan for your meals on Rainier. A bar or two is fine for “emergency food.”

CLOTHING: Many novice climbers bring a base-layer T shirt, a base-layer long-sleeved shirt, a fleece top, a lightweight puffy, a heavier puffy, a windbreaker and a shell jacket. A base layer, one medium to heavy puffy and one shell should be fine. Same with accessories. You don’t need three pair of gloves plus heavy mittens plus over-mitts, etc. One extra pair of socks should be fine. On a two-day climb you really don’t even need extra underwear. Seriously, you will be away from your car for maybe 36 hours.

LAST-MINUTE CRAP: A lot of people carry a wallet, cellphone and ring of keys that, added up, may weigh more than a pound. Think this through so you don’t have to leave valuables in the car at the trailhead, and leave them home instead. You need only the key to your car, a little cash, credit card and your ID - an ounce or two at most. Most folks don’t get cell coverage on Baker and many don’t get it on Rainier, so a phone is often 8 ounces of dead weight unless it is also your main camera.

As you gain experience, your pack will get even lighter, but you need to be diligent. After each trip, ask yourself what you used and what you didn’t. Many folks will realize after years of climbing that they have never used the 6-ounce multi tool in their repair kit. Others will finally see the folly in a 10-ounce insulated mug. Still others will realize that their three hard plastic Nalgens, which weigh nearly 7 ounces apiece, are easily replaced by one sport drink bottle and a 2-liter platypus bag for a total weight of less than 3 ounces as opposed to 20. And so forth. But they will need to start by LISTING and WEIGHING everything.

By following the *LAW of Light*, you too can have a more enjoyable and successful climb.

Glacier Climb Policies and Description

Mount Baker/Eldorado routes are climbed in two days. We schedule three-day climbs for Mount Rainier.

There will be a maximum of 12 OSAT members on each climb. Generally, four will be rope leaders and eight will be students, meaning four rope teams of three climbers. Your climb leader will choose rope leaders who are GCC graduates experienced in glacier travel. Together, the leaders will determine the makeup of the rope teams for the climb.

Before the Climb: Your climb leader will inform you of his or her plans to hold pre-climb meetings and other details that are specific to your climb. As your climb dates draw near, your leader will be watching the weather situation closely. Stormy conditions or avalanche danger may cancel your climb.

The Hike In: You will check in with your leader at a pre-appointed time at the trailhead or other nearby meeting place. Some climbers may choose to stay at the trailhead the night before or at a nearby campground, regardless, you must be ready at the pre-appointed time.

Most OSAT glacier climbs will begin on day one with a hike into basecamp. This hike may take anywhere from two to seven hours and can gain anywhere from 2,000 to 5,000 vertical feet. This hike is very strenuous, carrying full packs with enough food and equipment to ensure a successful summit attempt.

Setting up Basecamp: After setting up tents at basecamp, dinner is made and snow is melted for water. We may have a short inspirational meeting. We will normally awaken (or arise, for those unable to sleep) around 10:00 pm and try to be climbing no later than midnight on our appointed climb day. We will start early to take advantage of the frozen snow.

Alpine Start: It is critical for everyone to be ready at the time announced by the leader. Typically, a beginning climber will underestimate the time required to put on boots, gaiters, crampons, harnesses, prusiks and then tie the rope into his or her seat harness. This is in addition to starting a stove, cooking breakfast, answering calls of nature, selecting clothes suitable for the temperature, etc.

The Summit: After reaching the summit we will celebrate, rest, eat and drink, take pictures, and prepare to start our descent. Remember, the summit is a destination not the goal. The average success rate of Mt. Rainier summit attempts is 50%. A summit will occur at the leader's discretion pending route, weather, and team conditions.

The Descent: The descent back to our basecamp will take much less time than the ascent. Ideally, we will be off the glacier before the warmer part of the day when the snow usually gets soft and less stable. After returning to basecamp on summit day, we will pack up and hike down to the trailhead, normally arriving by late afternoon or early evening. The group usually stops to eat at a restaurant together on the way home, to socialize and re-live the experience and enjoy food and drink.



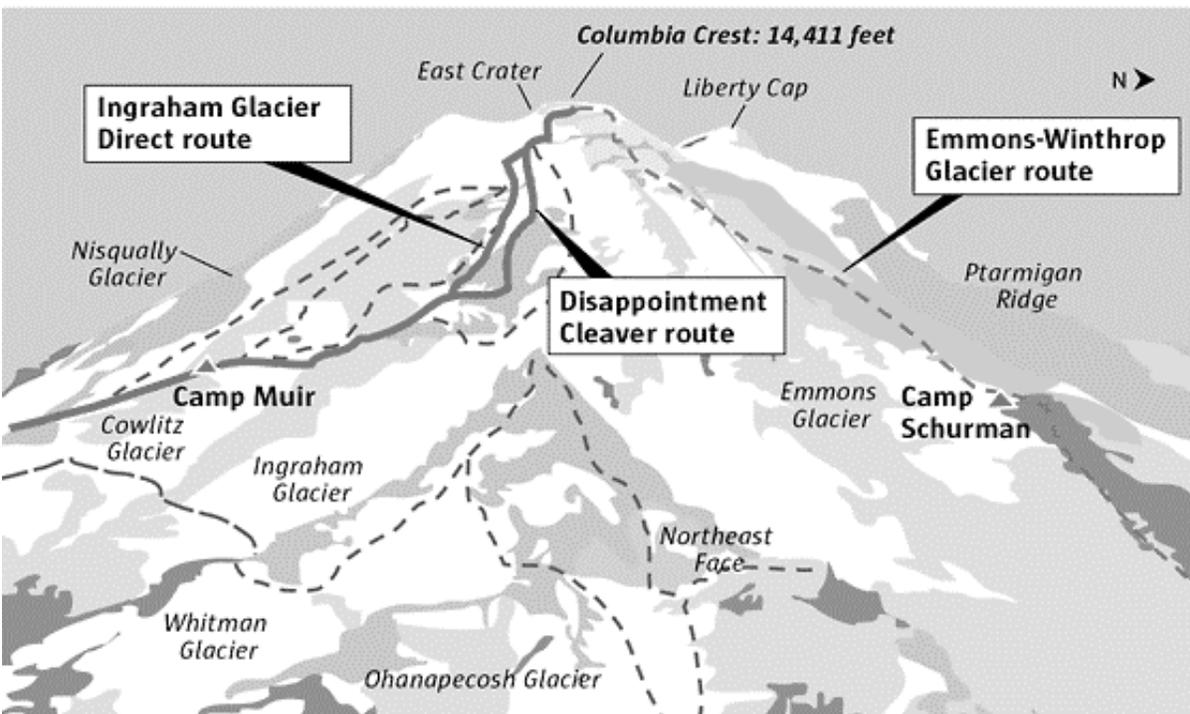
©Lindsey Koon

Routes on Rainier

There are many established routes ascending Mount Rainier, however the GCC focuses on two principal routes.

Disappointment Cleaver (“DC”) route: The most popular route on the mountain is the Disappointment Cleaver route, which passes through Camp Muir on the southeast side of the mountain. The majority of guide groups lead clients up the DC route, making it the busiest route on the mountain. The exact route changes yearly but typically leaves Camp Muir to cross the Ingraham Glacier before ascending the Disappointment Cleaver. From the top of the Cleaver the route switchbacks through crevasses to the south side of the summit crater.

Emmons Glacier route: The Emmons route is the second-most traveled route on Mount Rainier, passing through Camp Schurman on the north side of the mountain. The Emmons Route directly accesses the Emmons Glacier, switchbacking through crevasses up to the true summit of Mount Rainier. It is significantly more strenuous than the DC route.



YOU Can Be a Porter (aka “Sherpa”)

Porters are OSAT members who help GCC students carry gear to and from Camp Muir on the Disappointment Cleaver route, and Sherpa Rock at the bottom of the Interglacier on the Emmons Glacier route, on Mount Rainier. (There are no porters on Mount Baker climbs in order to better anticipate the exertion of climbing Mount Rainier.)

The Mount Rainier porter is a great OSAT and GCC tradition. Club members, fellow students, and past GCC graduates all gather to help and celebrate the climbers.

The first priority is for the porters to carry climbing ropes and pickets. An extension of the porter, and another great way to be of service, is to organize a carpool or offer to drive a climber home.

To respect OSAT’s party limit policy, porters climb separately from the summit climb party.

Giving Back

The entire Glacier Climbing Course, and all of its climbs, are run by former GCC graduates. Giving back is what keeps the GCC alive.

Graduating GCC students often ask how they can get more involved... here’s how:

- Porter (aka “Sherpa”) a climb for fellow students.
- Sign up for GCC seminars and fieldtrips.
- Get to know and even mentor current students.
- Sign up to help demonstrate a skill on a GCC field trip.

Not only will you be helping the club, you will be practicing your own skills at the same time. You can also volunteer to lead or co-lead a GCC conditioner. The GCC always needs conditioner leaders. Contact the conditioner chair and learn how to put a trip on the OSAT calendar.

Thank you for your participation in the 2019 Glacier Climbing Course

KCM&DS!

Artwork by OSAT members Lindsey Koon and Aizen Ulric.

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Additional Resources

Weather Forecasts & Avalanche Conditions...KNOW BEFORE YOU GO!

- NOAA – National Oceanic & Atmospheric Administration
- Mountainforecast.com
- Mt. Rainier Recreational weather forecast
- WTA (Washington Trails Association) – get trail descriptions, trip reports, driving directions, and weather forecasts specifically for the hike/climb you are searching.
- NWAC (Northwest Avalanche Center) – Remember, green doesn't always mean go. Get to know the site. Ask an instructor or mentor if you are unsure of avalanche danger. There are also classes that teach avalanche awareness.

Cheap Gear

- REI – Garage Sale (REI also has dividends and coupons for members)
- OSAT Gear Grab
- Mountaineers Gear Grab
- Ascent Outdoors
- Wonderland Gear Exchange
- (It's also possible to rent gear, such as snowshoes, sleeping bags, tents – check online for more information on where to rent mountaineering gear)

More reading material for glacier travel

- Glacier Travel & Crevasse Rescue – Andrew Selters
- The Mountaineers (mountaineers.org)