TACOMA BASIC ALPINE CLIMBING COURSE 2020

STUDENT MANUAL 

Mountaineers Basic Alpine Climbing Course Goals and Objectives[[1]](#footnote-0)

The Basic Alpine Climbing Course is a critical component of the Mountaineers’ outdoor educational program. These Goals and Objectives will provide a structure for the core mission and outcome for the program to ensure it is delivered with consistency and quality across the organization.

The Mountaineers as an organization recognizes that each branch must have the freedom to create its own structure for delivering the course in a way that serves its members, volunteers, and students most effectively.  It also recognizes that the course content must contain the necessary core curricula of skills and competencies to ensure that the program can produce capable and safe climbers*.*

*During the course, students of the Mountaineers Basic Alpine Climbing Course will have demonstrated the following:*

* **Proficiency and safety in the necessary skills and competencies** associated with the basic alpine climbing course (see list of “Basic Climbing - Necessary Skills and Competencies”)
* **Effective teamwork** while working and climbing with their fellow students, instructors, and climb leaders
* A sufficient, accurate, and **honest level of self-assessment** to properly determine their ability to successfully participate in basic alpine climbs.  Their self-assessment would include, but not be limited, to an accurate evaluation in the following:
  + Proficiency with the basic alpine climbing curricula of skills and competencies
  + A necessary level of conditioning and fitness
  + A level of comfort with exposure

Ability to match their skill and fitness level to selected activities

*At course completion, successful graduates of the Mountaineers Basic Alpine Climbing Course should be able to demonstrate the following:*

* Successful participation in a Mountaineers basic alpine climb as a **competent team member**
* The necessary judgment and skills to **engage in a non-technical mountaineering activity** within the context of a private party
* A sufficient understanding of **group dynamics and fundamental decision-making** skills in the backcountry
* An **awareness of hazards and good safety habits** to manage risk in the backcountry
* A mindfulness for **environmental stewardship and respect for other parties**

# Classroom Session #1

Course Introduction, Clothing/Equipment, Safety & Roped Climbing Overview

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| --- |
| **Classroom Session 1 Topics** |
| **Course Introduction & Overview** |
| **Clothing and Equipment** |
| **10 Essentials Systems** |
| **Mountaineers’ Climbing Code** |
| **Field Trip Leader Q & A (Field Trip #1 Prep, Field Trip #1)** |
| **Date: Wednesday February 5, 2020**  **Time: 6:30 PM**  **Duration: Approximately 3 hours**  **Location: Tacoma Mountaineer Clubhouse 2302 North 30th St, Tacoma** |
| **Assigned Reading** (complete prior to Field Trip #1) |
| |  |  | | --- | --- | | ***The Freedom of the Hills, 9th edition*** |  | | First Steps | Chapter 1 | | Clothing and Equipment | Chapter 2 | | Basic Safety Systems | Chapter 9 | |  |  |   ***Basic Rock & Glacier Climbing Course Manual***  All Lecture #1 Material |
| **Additional Resources**  **www.animatedknots.com**: Animated instruction on knot tying |

## GENERAL INFORMATION

Welcome to the Tacoma Mountaineers Basic Climbing Course (BCC). This course is an introduction to the core curricula required to safely follow a volunteer leader on basic alpine rock and glacier climbs. The course is physically, mentally and emotionally demanding, as well as time-consuming, but with proper preparation, the rewards can be many.

The BCC Committee has planned a program of instruction that will provide you with the fundamental information and skills necessary to become a competent and safe **BEGINNER** Mountaineer. This course is designed to provide a foundation for more advanced training.

We aspire to be the safest and most adventurous climbing community in the Pacific Northwest. We are motivated by the adventure of climbing, exploring, and experiencing the great outdoors. As volunteers and climbers, we do our best to provide quality instruction and climbing opportunities in a fun environment. We teach sound and specific mountaineering techniques so we can all climb safely together and rely on each other in the event of an emergency. We hope you will enjoy this course, explore a few peaks with us, make new friends, and become a part of our climbing community.

Our goal is to help each student become a safe, happy, and confident climber. If at any time you have a question, comment or problem during the course, please contact the appropriate member of the committee. We want you to complete this course and have a good time doing it.

## GRADUATION REQUIREMENTS

All requirements must be fulfilled, preferable in one, but within two years of starting the course.

1. Attend all of the Tacoma Mountaineers Basic Climbing Course (BCC) Classroom Sessions (CS).
2. Pass the written exam.
3. Satisfactorily complete all the field trips (FT) and field trip preps (FTP).
4. Satisfactorily complete two conditioner hikes with the Tacoma Branch. See page 5 for more information. **Students must wear mountaineering boots.**
5. Satisfactorily complete 3 Mountaineer’s basic climbs; one rock climb and one glacier climb. The third climb may be a rock, glacier, and/or alpine climb.Students must have different leaders for each climb. See page 5-6 for more information.
6. Hold a current Wilderness First Aid (WFA) certificate at the date of graduation.
7. Satisfactorily complete the Mountaineers’ Basic Navigation Course by the date of graduation.
8. Participate in one trail maintenance/conservation activity offered by the Mountaineers or other recognized organizations. This activity must be completed after the first lecture, but before the date of graduation.
9. Attend an Avalanche Awareness Seminar or hold an AIARE I certificate.
10. Acquire the Low Impact Recreation Badge. <https://www.mountaineers.org/membership/badges/skill-badges/low-impact-recreation>
11. Students must submit a completed application with a climbing picture of the student for graduation 7 days prior to the potluck date. The graduation application is available online and posted on the supplementary course page. <https://sites.google.com/view/basicclimbing2018/home>

## SECOND YEAR STUDENT REQUIREMENT

If you do not complete the course requirements by the graduation date of the first year, you may be eligible to register for the second-year course by paying a small fee.

All second-year students are required to complete a Skills Proficiency Evaluation held in January or February, prior to participating in the second-year course. Bring your pack and gear as if you were going on a climb. You will be expected to correctly demonstrate ALL essential and critical skills learned in the course, with no instruction. After the evaluation, it will be determined what Classroom Sessions, field trips, and/or climbs that you need to repeat, if any. All second-year students must satisfactorily complete a conditioner hike with a Tacoma Branch Leader prior to any climbs or prior to any field trips which require a conditioner, i.e. FT3 and FT 5.

To graduate, a second-year student must complete all requirements by the graduation date, and apply for graduation by submitting a graduate application online.

## RULES, GUIDELINES, AND REQUIREMENTS

## ASSIGNED READING

All assigned reading must be **read prior to the lectures and field trips.**

## Classroom Sessions

All Classroom Sessions will be held at the Tacoma Mountaineers Clubhouse located at 2302 N 30th St, Tacoma, WA 98403. The Classroom Sessions build on the assigned readings and are interactive and depend on students being prepared to actively participate. Be on time and make sure you have signed-in. Please be in your seat at 7 PM ready for the lecture! It is advised to arrive early so that you can help set up chairs, ask questions, sign in to receive credit, and take care of any administrative matters. After class, we ask that you help put away tables and chairs.

## FIELD TRIPS AND PREP SESSIONS

There are three FTP sessions held on weekday evenings:

* FTP 1: Fundamentals
* FTP 4: Rock Climbing
* FTP 6: Crevasse Rescue

There are two 2-day (Sat/Sun) weekend field trips (FT):

* FT 3: Winter Overnight
* FT 6 and FT 7: Crevasse Rescue and Hard Snow.

For FT1, FT2, FT4, and FT5, students may choose the Friday, Saturday, or Sunday session of a field trip. If you are flexible, please allow those people who can only attend on a given day the opportunity to sign-up first. Starting time varies from field trip to field trip; read the field trip section of this manual and always be on time.

## ATTENDANCE

This course teaches fundamental techniques and builds on them as the course progresses. There are consequences to missed FT, FTP and CS:

## CONSEQUENCE OF A MISSED SESSION

|  |  |
| --- | --- |
| **Missed Classroom Session** | **Consequence** |
| CS 1 | Cannot participate; dropped from the course. |
| CS 2 – CS6 | Cannot continue in the course, may become a 2nd year student. |
| Final Exam | Cannot graduate |
|  |  |
| **Missed Field Trip** | **Consequence** |
| FTP 1 | Cannot participate in any subsequent Field Trip; dropped from the course. |
| FT1 – FT4 | Must be made up to participate in subsequent Field Trips |
| FTP 4 | Must be made up to participate in subsequent Field Trips |
| FT 5 | Cannot participate in any rock climbs, may become a 2nd year student. |
| FTP 6 | Must be made up to participate in subsequent Field Trips |
| FT 6 | Cannot participate in any glacier climbs, may become a 2nd year student. |
| FT 7 | Cannot participate in glacier climbs, may become a 2nd year student. |

## “MAKE-UP” POLICIES AND LIMITATIONS

Understanding that emergencies occur, credit for selected BCC field trips **may** be obtained by attending the field trips of equivalent content offered by the other Mountaineers branches **if available**. Make-up policies and limitations are:

We do not allow substitutions for:

* Classroom Sessions: Substitutions are not allowed for any Classroom Sessions.
* Field Trips: Substitutions are only allowed for **one** field trip. This should be a last resort, emergency only, option. **Prior permission** from the BCC Committee is required to make-up a field trip. In addition, attendance at another branch requires that you obtain **that Branch’s** **permission prior to attending their field trip** and may require you to attend on the day they specify. Take a copy of the field trip makeup form (see Forms Section in Section I) **AND** a copy of the respective pages from the field trip booklet with you to the other branch's field trip. Then submit the make-up form with the filled-out pages from the field trip booklet to the Tacoma Branch BCC field trip leader and records chair.

1. **Justification for Substitution Policy:**
2. Some lectures/field trips are of such importance, or there is no equivalent available, that substitution is not allowed or available for those lectures/field trips.

## FINAL EXAM

The final exam for the Basic Course is all encompassing. It tests all the material covered in the lectures, all the material in the required readings out of *Freedom of the Hills* 9th edition and **this manual**. It is highly encouraged that you take notes during the lectures. A comprehensive review should be done to prepare for the final exam.

## CONSERVATION AND STEWARDSHIP REQUIREMENT

The Mountaineers community is built around creating volunteers, conserving our land, teaching skills, and sharing adventures. This requirement must be completed after the start date of the course and before graduation. It can be done with The Mountaineers or through an approved organization. Submit your conservation paperwork via the supplemental website at <https://sites.google.com/view/basicclimbing2018/home>

## BASIC CLIMBS

A Basic climb is one which, at its most difficult part, travels over at minimum class 3 terrain, steep and possibly hard snow, and/or glaciers. At their hardest they are grade II climbs with the maximum rock rating at 5.6. Below is important information to understand when considering signing up for climbs.

### DESCRIPTIONS AND PREREQUISITE FOR CLIMBS

**Conditioner Hike:** A conditioner hike is not a basic climb. It is defined as roughly 4,000 feet of elevation gain with at least 2 hours of sustained hiking, carrying 30 or more pounds. Summiting in 2.5 hours or less, is considered satisfactory completion of a conditioner hike. The conditioner hike must be completed with the Tacoma Branch before a basic student may participate on basic climbs and/or continue with the course.

**Conditioner requirements for Tacoma BCC: 2 conditioners under 2.5hrs OR 1 conditioner under 2hrs.**

### Basic Alpine (BA) A Basic Alpine Climb must travel over a significant amount of class 3, class 4 or low 5th class rock, or equivalently exposed, steep or hard snow, snow slopes. Roped travel on rock is to be no more than one pitch. Roped travel on crevassed glaciers is to be less than one hour (during the ascent). Off-trail travel will require significant use of hands or ice axe for safe travel

PREREQUISITES: You must satisfactorily complete a Conditioner. If the Basic Alpine Climb is on snow and does not involve any significant Class 4 or higher rock terrain, you must satisfactorily pass the ice axe arrest test during Field Trip 3 before the climb. If the Basic Alpine Climb involves climbing class 4 or higher rock, you must pass the ice axe arrest test during Field Trip 3 and pass the lead belay and rappel tests in Field Trip 5.

### Basic Rock Climb (BR) A Basic Rock Climb will include one or more pitches of class 4 to low 5th class rock. The route will not exceed four pitches or a rating higher than 5.6. A rock climb will include at least one rappel, one belay, and the cleaning of protection on at least one rock pitch by the student.

PREREQUISITES: You must pass the conditioner requirement and have satisfactorily completed field trips 1, 2, 4 & 5 if an ice axe is not required in the approach. If an ice axe is required in the approach, then you must have also satisfactorily passed the ice axe arrest test in Field Trip 3 and/or Field Trip 7.

### Basic Glacier Climbs (BG) A Basic Glacier Climb will include at least one hour of roped travel on a crevassed glacier on the ascent.

PREREQUISITES: You must pass the conditioner requirement and completed field trips 1-3, 6 &7, before going on a Glacier Climb which does not involve any class 4 or higher rock. If the Glacier Climb involves climbing any class 4 or higher rock then satisfactory completion of field trips 4 and 5 is also required.

# FUNDAMENTAL SKILLS

Mountaineering is a sport of controlled risk. Both objective hazards, dependent on the mountain environment, and subjective factors, dependent on the mountaineers, must be faced to safely and successfully climb. The objective hazards, such as bad weather, rock fall, and crevassed glaciers, cannot be controlled. However, the subjective qualities of the mountaineer, such as knowledge, skill**,** and judgment, can be developed to overcome or avoid the objective hazards encountered while climbing.

Classroom Sessions and field trips are designed to help you gain knowledge and practice the fundamental skills. Many of these skills must be performed proficiently by you in a test (without help from the instructor) or you will not be permitted to continue in subsequent field trips or climbs. Once a skill test has been passed, **you are expected to perform that skill proficiently in all subsequent course activities and on climbs.**

**Practice Makes Perfect:** Students will be required to perform fundamental essential and critical skills at each field trip and on climbs. The field trips will include a demonstration of each skill followed by practice and then a test. If you feel that you are not ready for an upcoming skill test, contact your mentor who can answer questions and provide additional guidance. Failing a skill test may seriously impede or stop your progress in the climbing course so it is very important that you be prepared.

**ESSENTIAL SKILLS**

All skills taught in the Basic Climbing Course are considered essential for you to safely and successfully participate in climbs. Below is a list of skills considered essential for alpine climbing:

**Physical Conditioning:** This is monitored at all course activities. You have two opportunities to satisfactory complete a conditioner hike to participate in the course. Completion of the first conditioner hike is required before Winter Overnight (FT 3) and satisfactory completion of a second conditioner is required prior to Rock 2 (FT 5). It is your responsibility to get in shape and to stay in shape. If you cannot satisfactorily complete a conditioner hike, you may not continue with the course this year but may continue as a second-year.

**Ten Essential Systems:** The 10 E’s will be checked at each field trip and must be checked off before FT 2. You may be excluded from field trips and climbs at leader’s discretion if equipment is not appropriate.

**Rock Climbing:** is practiced at FT 4 Prep and FT4, and then tested at FT 5. You must demonstrate rock climbing proficiency at FT 5. Satisfactory demonstration of rock climbing proficiency is required to participate in rock climbs. It is recommended that you practice on your own or request a mentor for additional assistance prior to FT 5 to ensure that your skills are proficient.

**Crevasse Rescue (3:1 (Z) Pulley and 2:1 (C) Pulley):** is introduced at CS 2 and practiced at FT3 and FT 6 Prep. You must be able to demonstrate crevasse rescue proficiency at FT 6. Crevasse rescue proficiency is required to participate in glacier climbs.

**Prusiking:** is demonstrated and practiced at FT 1 Prep and FT 1. Tested at FT 2. You must demonstrate prusiking proficiency at FT 2. Prusiking proficiency is required to participate in glacier climbs.

**Carabiner-Ice Axe Belay:** is demonstrated at FT 1 and practiced at FT 3. You must demonstrate carabiner-ice axe belay proficiency at FT 7. Carabiner-ice axe belay proficiency is required to participate in all climbs using an ice axe.

**Leader Tie-Off and Belay Escape:** is demonstrated at FT 1 Prep, practiced at FT1, and tested at FT2. Satisfactory demonstration of leader tie-off and belay escape is required to participate in rock climbs.

**Decision Making**: is discussed at lecture 4 and is an essential skill of life, not just climbing and outdoor activities. Group dynamics, decision making, and factors that influence this must considered throughout the course. Case studies are prepared for each CS to be read in advance.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Essential Skills*** | **FT1P** | **FT1** | **FT2** | **FT3** | **FT4P** | **FT4** | **FT5** | **FT6P** | **FT6** | **FT7** |
| **Conditioning** |  |  | **PRAC** | **PRAC** | **PRAC** | **PRAC** | **REQD** |  | **REQD** | **REQD** |
| **10 Essentials** |  | **PRAC** | **PRAC** | **TEST** | **REQD** | **REQD** | **REQD** |  | **REQD** | **REQD** |
| **Rock Climbing** |  |  |  |  | **PRAC** | **PRAC** | **TEST** |  |  |  |
| **Crevasse Rescue** |  |  | **PRAC** | **PRAC** |  |  |  | **PRAC** | **TEST** |  |
| **Prusiking** | **PRAC** | **PRAC** | **TEST** |  |  |  |  |  | **PRAC** |  |
| **Carabiner-Ice Axe Belay** |  |  | **PRAC** | **PRAC** |  |  |  |  |  | **TEST** |
| **Leader Tie-Off w/ Escape** | **DEMO** | **PRAC** | **TEST** |  | **REQD** | **REQD** | **REQD** |  |  |  |

DEMO Demonstrated by Instructors PRAC Student Practice TEST Student Proficiency Test REQD Student Proficiency Required

### CRITICAL SKILLS

A few of the essential skills have been identified as not only essential to successful climbing but critical to safety. Critical skills, if not performed properly, present an immediate risk of serious injury or death to you and/or your climbing partner(s). Particular attention will be paid to critical skills during field trips and climbs.

**Knots:** Knots are demonstrated at FT 1 Prep and all required knots are practiced at FT 1 and FT 2. You must complete the knot test prior to FT 4 (by end of FT 3) for participation in FT 4. Knot tying proficiency is required to participate in all subsequent field trips, and rock and glacier climbs. It is recommended that you practice on your own or request a mentor for additional assistance prior to FT 3 to ensure that your skills are proficient.

**Belays (Münter Hitch and Device):** are demonstrated at FT 1 Prep and practiced at FT 1. You must demonstrate belaying proficiency with weight drops at FT 2. Belaying proficiency is required to participate in FT 4, FT 5, and rock climbs. If you encounter difficulty at FT 1, it is recommended that you practice on your own or request a mentor for additional assistance prior to FT 2 to ensure that your skills are proficient.

**Rappels (Carabiner Brake and Extended Device):** are demonstrated and practiced at FT 4 Prep and FT 4. You must demonstrate rappelling proficiency at FT 5. Rappelling proficiency is required to participate in rock climbs. If you encounter difficulty at FT 4, it is recommended that you request a mentor for additional assistance prior to FT 5 to ensure that your skills are proficient.

**Ice Axe Arrests:** are practiced and tested on snow at FT 3 and FT 6. Ice axe arrest proficiency on soft snow is tested at FT 3, and is required to participate in FT 6 and all climbs where ice axe use is required. Ice axe arrest proficiency on hard snow is required to participate in basic rock, glacier and alpine climbs and scrambles where ice axe use is required following FT 6.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Critical Skills*** | **FT1P** | **FT1** | **FT2** | **FT3** | **FT4P** | **FT4** | **FT5** | **FT6P** | **FT6** | **FT7** |
| **Knots** | **PRAC** | **PRAC** | **REQD** | **TEST** | **REQD** | **REQD** | **REQD** | **REQD** | **REQD** | **REQD** |
| **Belays** | **DEMO** | **PRAC** | **TEST** |  | **REQD** | **REQD** | **REQD** |  | **REQD** | **REQD** |
| **Rappels** |  |  |  |  | **PRAC** | **PRAC** | **TEST** |  |  |  |
| **Ice Axe Arrests** |  |  |  | **REQD(S)** |  |  |  |  |  | **TEST(h)** |

DEMO Demonstrated by Instructors PRAC Student Practice

REQD Student Proficiency Required REQD(S) Student Proficiency on Soft Snow Required

TEST Student Proficiency Test TEST (h) Student Proficiency Test on Hard Snow

### FIELD TRIP EVALUATIONS

**Skills Assessment and Evaluation at Field Trips**

**S** **Safe** – After instruction is given, the student is able to demonstrate the skill with minimal or no prompting from the instructor.

**NS** **Not Safe** – After instruction is given, the student is not able to demonstrate the skill, even with major prompting from instructor.

There are two ways to get a NS Grade:

* + - 1. You did not demonstrate proficiency of a Critical or Essential skill during a skills test at a field trip.
      2. A field trip instructor or leader finds you have regressed, and are deficient in an Essential or Critical Skill at a later field trip.

A grade of **NS** does not prevent student from continuing in the course. However, the student must master the skill before being **tested** by their mentor. The student must complete a self-assessment form and contact the Critical Skills Chair for the course and his/her mentor to plan for corrective action, then follow with a retest of the skill.

**Self-Assessment and Instructor Assessment**

It is important to self-assess your own progress and reflect on your learning throughout the course. Practical self-assessments will occur during lectures and at field trips in the yellow books that track your skills progression. Instructors are also encouraged to contribute qualitative assessments of skills in the yellow books for constructive feedback. Being open, honest, and communicative is a critical piece of developing into a safe and competent climber (and human).

## Knots

Knot-tying is an inherent part of roped climbing, and you and your partner’s safety depends on the ability to tie appropriate knots correctly and to recognize correctly tied knots. You will be tested on all the listed knots at all field trips. Your knots will be inspected for good dressing, and you will be expected to be able to tell how and why each of the knots is used.

The following knots are required for the Tacoma BCC.

|  |  |
| --- | --- |
| Girth hitch | Water knot |
| Figure 8 loop (Figure 8 on a bight) | Rewoven Figure 8 (Figure 8 Follow Through) |
| Single Bowline (Bowline) | Double Fisherman’s knot |
| Prusik knot | Clove hitch |
| Münter hitch | Bowline on a coil |
| Alpine Butterfly | Bachmann knot |
| Mule Knot | Flat Overhand Bend |

## CLOTHING AND EQUIPMENT

We encourage you to research and discuss equipment and clothing with fellow students and instructors, study blogs and websites, ask store representatives, and shop around before selecting your own gear. An item that is just right for someone else may be a poor choice for you. There is no such thing as bad weather, only bad clothing and equipment.

**CLOTHING**

No single garment or fabric is ideal for all climbers or all situations. You can optimize the effectiveness of your clothing system by applying a layering system. Layering allows for easy adjustments to fluctuating backcountry conditions, and your own internal heat and moisture management.

**Please refer to Chapter 2 in Freedom of the Hills, 9th edition.**

Used clothing and gear works fine and saves money. Cotton clothing is not appropriate and is not permitted on climbs or field trips.

**EQUIPMENT**

Caution: While it is OK to buy inexpensive equipment (e.g., sale or used items, or items without “bells and whistles”), avoid cheap equipment. It will fail at the worst possible time! It is also important that you purchase new items that are critical to your safety (harnesses, webbing) to avoid costly mistakes. Ask experienced members of the club for advice and recommendations on equipment. It may be prudent to spend a little more on the “right” piece of equipment rather than spending twice to replace the “wrong” pieces.

**Mountaineering Boots:** Do not economize here. Boots will be one of your most important equipment purchases. Go to the store and find a properly fit boot and spend time wearing the boots in the store and at home to ensure a good fit. Buy your boots early and break them in soon. Hiking boots cannot be used for this class.

**Gaiters:** You should be able to put them on without removing your boots. Knee high gaiters are preferred. Gaiters should be sturdy and intended for use with crampons.

**Pack:** Look for a well-fitting and comfortable pack. Have your torso measured and pack fit by a knowledgeable person to ensure a comfortable fit. Ensure you know how to adjust the pack. You will need a day pack on all the field trips and one-day climbs. A day pack should be at least 30-45 liters, and capable of carrying 25-40lbs. A pack for two-three days should be 50-70 liters and be capable of carrying 40-60 pounds. Instead of two separate packs you may use a multi-day pack, that can be compressed for fieldtrips and day climbs. **External frame packs are not suitable for climbing because they increase the difficulty of self-arresting a fall on snow and the tendency for them to hang up on branches and rock edges.**

**Helmet:** An UIAA approved climbing helmet is required for all field trips, rock and glacier climbs.

**Ice Axe:** A general mountaineering ice axe is required. Size: You will need 2-3 inches of clearance from the end of the spike to the top of the boot, while standing in an upright position holding on to the axe between the adze and the spike.

**Crampons** – A 10 or 12-point set of general or technical mountaineering crampons are required for the course. Make sure the crampons are compatible with and properly fit your boots.

**Seat Harness:** Must be UIAA approved. Gear loops are desirable for carrying carabiners and other gear. Make sure there are no pinches while hanging and walking around in it. Waist belt strap must have 2 to 3 inches sticking out after threaded through the buckle following the manufacturers’ recommendations. Study the instructions provided by the manufacturers and always follow their recommendation for using the harness.

**Belay Device:** The only approved belay devices for the basic course are the tubular type (Black Diamond ATC, ATC-XP, Petzl Reverso, etc.). Tubular device with friction grooves is recommended. **The “Figure 8” and “Petzl Grigri” devices are NOT acceptable for this course.**

**Large Pear-Shaped Locking Carabiner:** Either screw lock or auto-locking are acceptable.

**ADDITIONAL EQUIPMENT CONSIDERATIONS**

**Sleeping Bag:** Recommended temperature rating 32ºF or less for summer conditions. 15ºF or less for winter/snow camping

**Eleven’s**: Although these items are not required as part of the “Ten Essential Systems,” many consider them an extension of the ten essentials:

* **Insect repellent**: try it and your sunscreen at home to be sure you are not allergic to them.
* **Signal device**: audible (whistle) and visible (signal mirror and flashlight).
* **Nylon cord**: 25ft or longer 3/32" or 1/8" nylon cord. Can be used for: equipment repair, hanging food, rigging tarp for shelter.
* **Garbage bag (30 gal or larger)**: For waterproofing, carrying garbage out, and sometimes glissading, rain cover, emergency shelter.
* **Toilet Paper**: in waterproof zip lock type bags.
* **Duct Tape** – wrap a few feet around your ice axe, trekking poles, or water bottle.
* **Sit Pad** - Small piece of water resistant foam or self-inflated pad to reduce conductive heat loss. May also be useful for splinting
* **“Blue Bag” System**: A double bag system for use where feces cannot be properly buried, such as snow or rock, or in areas of high human impact.

**Group Gear:** On every climb, certain gear is taken along in case of emergency situations. This gear is distributed to all party members. The climb leader will determine the minimum requirements for “group gear” on a given trip:

|  |  |
| --- | --- |
| * Stove/fuel/pot * Ground insulation * Bivy sack/Emergency Shelter | * Sleeping bag or sufficient extra clothing (within party) * Water Filter * Shovel |

**EQUIPMENT & CLOTHING: NOTES ON EXPENSES**

Climbing requires a fair amount of equipment, and if you are not already a well-equipped hiker, it can be expensive to outfit yourself. If you have the resources, and want all new, or top-of-the-line, gear its easy to spend $1,000 or more. Most of us don't fall into that category. Fortunately, there are plenty of options available, if you are on a tight budget.

* **USE THINGS YOU ALREADY HAVE** – Most have a few items at home that are perfectly adequate – wool clothing, first aid supplies, hats, mittens, sunglasses, etc.
* **PURCHASE USED EQUIPMENT** – There are several second-hand sporting and outdoor shops in the area. Thrift stores, surplus stores, and even garage sales are also great places to check.
* **BE AN INFORMED BUYER** – It’s easy to spend more money than necessary. Talk to the BCC Committee members and other experienced leaders, instructors, or climbers to gather as much information as you can. Remember, though; take no one's advice as absolute. *It's ultimately YOUR choice to determine what's best for you.*

**EQUIPMENT NOTE: FOR FIELD TRIP 1 PREP**

Have your webbing and perlon cut at the store when you buy it! **Use different colored webbing for different sized slings (short, singles, double, personal anchor, chest harness).** The different colors allow you to easily recognize the length and what the sling is used for.

* Total of 46 feet of 1-inch tubular webbing cut to the following lengths:

(1) 10 foot – double sling **(2)** 6 feet – single slings

(1) 4 foot – short sling (1) 9 foot – chest harness sling

(1) 11 foot – personal anchor (not needed if you already have a Black Diamond or Metolius PAS)

* Total of 29 feet of 5mm perlon cut to the following lengths:

(1) 4 foot section for Tie-off loop #1 (glacier ropes/thin ropes)

(1) 25 foot section for Texas Prusiks (DO NOT CUT) – Make this a different color than other perlon

* Total of 17 feet of 5 mm perlon cut to the following lengths:

(1) 5 foot section for Auto block (1) 8 foot section for pack sling

(1) 4 foot sections for Tie-off loop #2 (used on thicker ropes/rock ropes)

**EQUIPMENT MATRIX**

The below equipment matrix identifies equipment that will be needed at each field trip.

NOTE: MODIFICATIONS TO THIS LIST MAY BE MADE IN CLASS.

Field Trip Prep and Field Trip

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Required Equipment** | 1P | 1 | 2 | 3 | 4P | 4 | 5 | 6P | 6 | 7 |
| One Double Sling (1” tubular webbing) | **S** | X | X | X | X | X | X | X | X | X |
| Two Singles Sling (1” tubular webbing) | **S** | X | X | X | X | X | X | X | X | X |
| One Short Sling(1” tubular webbing) | **S** |  | X | X |  |  |  | X | X | X |
| Personal anchor (1” tubular webbing) | X | **S** | X | X | X | X | X | X | X | X |
| Chest harness (1” tubular webbing) | **S** | X | X | X |  |  |  | X | X | X |
| Two Tie-off slings (5mm perlon) | **S** | X | X | X | X | X | X | X | X | X |
| Pack sling (5 mm perlon) | **S** | X | X | X |  |  |  | X | X | X |
| Auto block (5 mm perlon) | X |  |  |  |  | **S** | X |  |  |  |
| Texas Prusiks (5 mm perlon) | **C** | X | X | X |  |  |  | X | X | X |
| Seat harness | X | X | X | X | X | X | X | X | X | X |
| 4 Oval carabiners | X | X | X | X | X | X | X | X | X | X |
| 5 Standard carabiners (may be solid or wire gate) | X | X | X | X | X | X | X | X | X | X |
| 4 Medium Locking carabiners (in addition to pear) | X | X | X | X | X | X | X | X | X | X |
| 1 Large locking pear-shaped carabiner | X | X | X | X | X | X | X | X | X | X |
| Belay gloves |  | X | X |  | X | X | X |  |  |  |
| Ten Essential Systems (including map) |  | X | X | X |  | X | X |  | X | X |
| Pack (50-65 liter) | **D** | **D** | **D** | X | **D** | **D** | **D** | **D** | X | X |
| Mountaineering boots |  | X | X | X | X | X | X |  | X | X |
| Sturdy boots/shoes | X |  |  |  |  |  |  | X |  |  |
| Approved belay device | X | X | X | X | X | X | X |  | X | X |
| Climbing helmet | X | X | X | X | X | X | X |  | X | X |
| Chock pick |  |  |  |  | X | X | X |  |  |  |
| Ice axe with leash (cover adze w/ duct tape) |  |  | X | X |  |  |  | X | X | X |
| Rescue pulley |  |  | X | X |  |  |  | X | X | X |
| Tent for 2-3 (3 or 4 season w/ snow stakes) |  |  |  | X |  |  |  |  |  |  |
| Snow shovel |  |  |  | **X** |  |  |  |  | **R** | **X** |
| Sleeping bag (warm to 30ºF or less, check weather) |  |  |  | X |  |  |  |  |  |  |
| Sleeping pad |  |  |  | X |  |  |  |  |  |  |
| Stove, fuel, & pot |  |  |  | **T** |  |  |  |  |  |  |
| Aluminum picket, 24” in length |  |  | X | X |  |  |  | X | X | X |
| Personal items (utensils, cup, hand warmers) |  |  |  | X |  |  |  |  |  |  |
| 10 or 12-point crampons (check fit on YOUR boots) |  |  | X | X |  |  |  |  | X | X |
| Appropriate clothing layers (check the weather) | X | X | X | X | X | X | X | X | X | X |
| Gaiters |  |  |  | X |  |  |  |  | X | X |
| Snowshoes |  |  |  | X |  |  |  |  | **R** | **R** |
| Blue Bag System |  |  |  | X |  |  |  |  | **R** | **R** |
| Lunch |  | X | X | X |  | X | X |  | X | X |
| Food for 2 days |  |  |  | X |  |  |  |  |  |  |

Legend:

|  |  |
| --- | --- |
| C = Cut and tied at Field Trip 1 Prep (do NOT cut beforehand!)  D = Day pack (~2500 in3) acceptable alternative  R = Recommended, but optional for this field trip | S= Sized and/or tied at Field Trip  T = Per Tent  X = Required |

Field Trip Prep and Field Trip

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Optional Equipment** | 1P | 1 | 2 | 3 | 4P | 4 | 5 | 6P | 6 | 7 |
| Sit pad |  | X | X | X | X | X | X | X | X | X |
| Bivy sack and/or space blanket |  |  |  | X |  |  |  |  | X | X |
| Toilet Paper |  |  |  | X |  |  |  |  | X | X |
| Hand Sanitizer |  |  |  | X |  |  |  |  | X | X |

**THE TEN ESSENTIAL SYSTEMS**

A list of the Ten Essentials was first developed by climbers in the 1930s, and is still utilized in order to attempt to prepare individuals to survive the unexpected. ***You are required to carry your 10 E’s on all field trips and climbs.***

|  |  |
| --- | --- |
| 1. Navigation 2. Sun protection 3. Insulation (extra clothing) 4. Illumination (head lamp) 5. First-aid supplies | 1. Fire 2. Repair kit (knife) 3. Nutrition (extra food) 4. Hydration (extra water) 5. Emergency shelter |

**10 E’s RECOMMENDATIONS AND IMPORTANT NOTES:**

* **NAVIGATION**

**Compass Requirements** - The Mountaineers Navigation Course has compass requirements (adjustable declination, sighting mirror, etc.) so be sure to check with that program when purchasing your compass.

**Altimeter** **and GPS** - not required as a basic student

* **ILLUMINATION**

**Headlamp** –make sure it water resistant and utilizes a switch that cannot (accidentally) be turned on in your pack. Recommended: 90 lumens or more

**Extra Batteries** – are required as part of the Tacoma Branch 10E’s

* **FIRST AID SUPPLIES**

**First Aid Kit** – An adequately prepared mountaineering oriented first aid kit must be carried on every trip.

***Note:*** *If you are injured, the rescuer will use your first aid kit to administer first aid on you.*

* **FIRE - Practice with your fire starter system outside on a rainy day BEFORE you go into the outdoors.**

**Matches** – An emergency supply of waterproof matches stored in a waterproof container. Carry a striker in the waterproof container as well. *A lighter is not an acceptable substitute for emergency matches*.

**Fire Starter** –Common fire starters not included in FOH: a small candle (table type, not birthday) or fuel tablets. It should be noted that fuel tablets (such as Hexamine) produce toxic fumes.

* **REPAIR KIT & TOOLS:** Many useful items can make up a repair kit such as duct tape, webbing, accessory cord, safety pins, zip ties, handkerchief, etc. At a minimum you must have a **knife** to satisfy this requirement. Recommendations: A stainless steel folding blade of 2 to 4 inches of length

## MOUNTAINEERS' CLIMBING CODE

The climbing code is a standard of judgment based on many years of mountaineering experience. In risky or doubtful situations, following this climbing code increases the margin for safety and success. Follow it religiously. It is so important we are also listing it here in the manual for you.

1. A climbing party of three is the minimum, unless adequate pre-arranged support is available. On glaciers, a minimum of two rope teams is recommended.
2. Rope on all exposed places and for all glacier travel. Anchor all belays.
3. Keep the party together, and obey the leader or majority rules.
4. Never climb beyond your ability and knowledge.
5. Never let judgment be overruled by desire when choosing a route or turning back.
6. Carry at all times the clothing, food, and equipment necessary.
7. Leave the trip schedule with a responsible person.
8. Follow the precepts of sound mountaineering as set forth in textbooks of recognized merit.
9. Behave at all times in a manner that will not reflect unfavorably upon mountaineering.

**Classroom Session 1: KEY POINTS, OBJECTIVES AND MENTOR MOMENT**

**Key points:**

* Critical skills and essential skills: know what they are and why something is considered a critical versus essential skill.
* Gear: what specific considerations are unique to mountaineering gear? To the clothing and sleep systems you will use? To the impact of gear weight/bulk on a climb?
* Safety: contributing factors to mountaineering accidents; rock and glacier climbing specific hazards; prevent incidents; do safety check of anchor, yourself, and your partner
* 10 Essentials: know what they are and how to use them

**“Mentor Moment”**

This course is physically, mentally, and emotionally demanding. It is designed to provide you with the basicinformation and skills to become a competent and safe beginning Mountaineer—this course is not intended to prepare students to become climb *leaders*; rather, you are expected to gain the skills to contribute to safety and success as a *member of a climbing team*. Leading climbs is a skill in focus in the Mountaineers Intermediate Alpine Climbing Course. Standards must exist to ensure the safety of all the participants.

**Getting Ready – Taking Responsibility**

* Organize: If you haven’t done so already get a calendar and plot out all the course lectures, field trips and other important dates. Compare the dates to your work schedule and family commitments. Look for potential problems and start planning what you will do.
* Get Fit for Climbing: Get yourself ready by physically conditioning- construct a personal fitness plan and implement it. There is nothing like getting out and doing the activity. Take advantage of the many day hikes and scramble trips the club offers. Get out with other students. Ask any leaders/instructor what they do to train.
* Prepare & Practice: Review the suggested material prior to field trips and lectures. Practice prior to and after the field trip. Get a partner and work together. If you are having problems, contact your mentor.

**Field Trip Survival:**

* Read all field trips information prior to the field trip – the instructors will know if you didn’t. It is easy to tell who didn’t read vs who doesn’t understand.
* **TO BE EARLY TO IS TO BE ONTIME. TO BE ONTIME IS TO BE LATE. TO BE LATE IS TO BE LEFT.** This means be dressed, with all appropriate gear, at the designated start time.
* No cotton clothing on field trips, except underwear or hats. The only exception will be Field Trip 1 Prep at the clubhouse – Substantial **boots** are required at Field Trip 1 Prep. No tennis shoes.
* Bring a change of clothes for the drive home. You can count on it raining on FTs more often than not.
* Bring plenty of snacks and a thermos of something hot. Eat and drink often, there will be no designated lunch breaks. Get in the habit of drinking water frequently during FTs.
* Restrooms: Leavenworth FT 5 will have a “Port-a-Potty” and the Tacoma clubhouse has restrooms. All snow FT’s will have a designated area for the group and use the blue bag system.
* Ask questions! Ask multiple instructors how they do things, different instructors teach differently, one person’s way of remembering or practicing might not connect with you. There is a good chance that somebody else’s does.
* If you finish early, practice other skills and/or help other students with skills. If you can teach it, you obviously know it.

**DATES TO REMEMBER!**

* The Belaying, Prusiking, and Leader-Tie off with escape must be passed by the end of Field Trip 2.
* Practice your knots and attempt to pass the Knot Test as early as possible. The Knot Test must be passed by the end of Field Trip 3. The Ten Essential System must be passed by the beginning of FT 3.
* Two conditioners must be passed; One prior to FT 3 and the second prior to FT 5 or any climbs. Sign up for these ASAP.

* Sign up for the Navigation and WFA courses early. They fill up, and students miss out on graduating every year.
* Sign up for an Avalanche Awareness class before FT 3.

# Classroom Session #2

**Nutrition and Conditioning**

|  |
| --- |
| **Classroom Session 2 Topics** |
| **Health & Nutrition**  **Conditioning** |
| **Field Trip Leader Q & A (Field Trip #2)** |
| **Date: Wednesday March 4th, 2020**  **Time: 7 PM**  **Duration: Approximately 3 hours**  **Location: Tacoma Mountaineer Clubhouse 2302 North 30th St, Tacoma** |
| **Assigned Reading** (complete prior to arrival) |
| ***The Freedom of the Hills, 9th edition***   |  |  | | --- | --- | | Camping, Food and Water | Chapter 3 | | Physical Conditioning | Chapter 4 | | Alpine Rescue | Chapter 25 | | Basic Safety System | Chapter 9 | |  |  |   ***Basic Rock & Glacier Climbing Course Manual***  All CS #2 Material |
| **Additional Resources**  Accidents in North American Mountaineering  Watch this video on the basics of belaying (PBUS device method) : **http://blog.alpineinstitute.com/2013/10/toprope-climbing-belay-technique.html**  [**www.bodyresults.com**](about:blank): Mountain climbing conditioning video and articles on sports specific training  *Training for the New Alpinism* by Steve House and Scott Johnston |

## Health and Nutrition

Maintaining your health and energy in the mountains is not tremendously different from what you do every day - you need to eat, drink, stay warm, rest and have ok hygiene. It does, however, require a little more creativity, effort and planning ahead. 

**Health/Hygiene Tips and Tricks**

* Bring a hand wipes or a small bottle of hand sanitizer to use:
  + after washing your hands in a lake or stream
  + before eating or preparing food
  + after going to the bathroom
* Do not eat snow/ice – it may appear pure, but it’s likely not
* Always use filtered water for drinking and/or brushing your teeth
* If bringing other hygiene products (deodorant/body wipes) make sure to put them in a separate air tight bag/container – they must be put into a bear canister or hung up with the rest of the food at night or when leaving camp.

**Climbing Day Nutrition**

On short trips, ensure you have plenty of water and food to sustain your energy level until you reach your goal. The lighter the food is, the less weight you have to carry on your back. At the same time, it’s not a good idea to short-cut on needed calories, electrolytes and especially not on water.

**WATER:** As a general rule of thumb, you should drink a about one liter per hour at lower altitudes, moderate temperatures, and medium exertion, and up to 1.5 liters per hour at higher elevations, in extreme environments, and/or high levels of exertion. In addition to these recommendations, monitor urine output and color. Urine should be copious and clear. You are not drinking enough if you are not urinating and/or it is dark in color. Try to remember to drink **before** you start to get thirsty.

**FOOD**: Energy requirements (i.e. calories) will vary somewhat depending on an individual’s conditioning and metabolism, as well as on the length and strenuousness of the climb. Overall, you should expect to expend between 2500 - 4500 calories per day on an average climb in the Pacific Northwest. Plan your food accordingly!!! Include:

* Simple carbohydrates for fast energy and muscle recovery (ie something to snack on if you start to feel tired or are taking a quick break). Good sources of this are: honey sticks, dried fruit, candy, chocolate, and gels.
* Complex carbohydrates for sustained energy and to keep hunger away (i.e. something you would eat for breakfast, lunch or dinner). Good sources of this are: breads, rice/pasta, tortillas, pizza, oatmeal, and bars.
* Protein to help in muscle repair and recovery and to keep you feeling full longer (i.e. eat this when you stop for a longer breaks or are starting to get hungry): Good sources: tuna packets, beef or turkey jerky, and pepperoni sticks.
* Fats help to keep you full and provide the needed energy for high altitude/extremely cold temperature expeditions. Good sources: nuts and nut butters
* Electrolytes: your body needs these salts to function properly, and to prevent muscle cramps. Make sure you continue to take in electrolytes because you sweat out a ton. Good sources: Gatorade, nuun, and sports legs
* **IDEAS FOR PREPARING FOR A TRIP:** Take foods that are simple to prepare and require minimal clean-up. Prepackage/repackage your food to save on bulk and weight.
* **Breakfast**: Often eaten cold to save time. Granola, granola bars, French rolls, “muesli” cereals, bagels, and dried fruit are all good choices. Instant oatmeal, cocoa, and herb tea are popular when taking the time to cook. Try to always eat breakfast, even if you are not hungry. If you are having a hard time eating breakfast, keep food easily accessible.
* **Lunch:** It is best to “snack” from breakfast until dinner—get something to drink and munch at every stop. Suggestion: Sandwiches, pizza, Granola bars, GORP, cheese and crackers, beef jerky, dried fruit, or bagels. “Sport drinks” such as Gatorade, ERG, etc. will help maintain needed body salts (“electrolytes”) as well as providing energy.
* **Dinner:** Begin replenishing water supplies as soon as you get into camp. Cocoa, Gatorade, protein powder or hot Jell-O will add energy as well as fluids. Herb tea or various drink flavorings are good for just rehydrating. Food options are many and varied. Freeze-dried foods are easy but expensive; quality is variable. Many grocery-store items work well, either alone or when combined: couscous meals, Top Ramen, instant soups, instant rice, dried or packaged meats etc. Be as creative as you’d like when planning your meals— but make sure they work at home before trying them out on a trip.

**INADEQUATE NUTRITION**

* **Bonking/Hitting the Wall:** Bonking or “hitting the wall” is a popular name for a condition in endurance sports and mountaineering when an individual has a sudden and overwhelming feeling of running out of energy. You are hiking along at what seemed like a manageable pace, then seemingly without warning your legs turned to cement. With heavy legs, a body-wide feeling of fatigue and sometimes dizziness, you are forced to stop.

Bonking is caused by running out of the stored glycogen (aka food/energy for your brain and muscles) in the liver and muscles. This severe glycogen depletion does not occur during short duration, high intensity efforts, rather it occurs during continuous exercise at some 70- to 85-percent of VO2 max that is sustained for periods of more than about two hours.  Hence, why conditioning (increasing VO2 max) and (nutrition) eating an adequate amount of calories is important for mountaineering.

* **Dehydration**: Occurs when you use or lose more fluid than you take in, and your body doesn't have enough water and other fluids to carry out its normal functions. Signs and symptoms: dry/sticky mouth, tiredness, dry skin (when everyone else is sweating), headache, dizziness, and cramping. Make sure to continuously take in fluids.

## CONDITIONING

Mountaineering can be a very rewarding experience. However, your desire to climb mountains and scramble in the high country does not automatically give you the aerobic capacity or psychology you need to be a capable member of a climbing party. For lack of physical or psychological conditioning, numerous destinations are not reached and the trip becomes an ordeal for all involved.

**PHYSICAL CONDITIONING**

The most important piece of equipment you have is your body. Muscles and bones are created for work and will increase in capacity to handle the load required. This premise is the basis for body conditioning and lack thereof can affect the individual and party to the point of considerable hazard.Tired climbers slow group progress and become increasingly faulty in movement and judgment. Make sure your conditioning program will allow you to participate in all activities **comfortably and safely**.

**Are You in Acceptable “Condition”?**

If you are in acceptable condition for mountaineering, you can ascend non-technical terrain at a rate of about a thousand feet per hour with a 35 – 40lb pack and maintain that pace for three or more hours.

**If You Are Not In “Condition”**

* You are out of breath and fatigued after a short period of time.
* More lactic acid accumulates in your muscles from exertion - tending to produce cramps and stiffness.
* When you force yourself to reach the summit, you do so at great cost to your body’s economy.
* You have no reserves. You recuperate slowly, and are still tired the next day
* When you push yourself to exhaustion, you frequently stumble and become too tired to think clearly.
* You are/can become a liability to the party.

**If You Are In “Condition”**

* You can keep going more comfortably and for a longer period of time.
* There is less lactic acid in your muscles from exertion and consequently little or no stiffness or soreness.
* You have the ability to push yourself further with safety.
* You have a real reserve available for an emergency, and recuperate faster after an exhausting effort.
* Your body functions automatically and you can concentrate on route finding and technical skills.
* You are an asset to the party and can enjoy yourself.

**Conditioner Requirements for Tacoma Basic Climbing Course: 2 conditioners under 2.5hrs OR 1 conditioner under 2hrs.**

**PSYCHOLOGICAL CONDITIONING**

An often-overlooked component of mountaineering for the beginning mountaineer is psychological conditioning. In addition to the physical and financial expenditures, the BCC has psychological demands. These include time commitment, exposure to new and potentially anxiety provoking experiences, and effects of intensive learning.

**TIME**

This course will affect your home life, friends, family, and pets. Providing people with a thorough account of the commitment you are undertaking will do two things: (1) Give them the information they need to understand how this will affect them, and (2) help garner their support — from which you will benefit!

**EMOTIONAL CONSIDERATIONS**

Mountaineering will expose you to potentially anxiety provoking experiences, from glaciers and crevasses, to sheer rock faces, to long hikes out by headlamps in the dark, when you are bone tired. Be honest and make an agreement with yourself to challenge yourself at a pace that you can tolerate and sustain. There is no value in comparing your experience with someone else. Teamwork helps keep things in perspective. Mountaineering is a two-way experience - at each end of the rope.

**COGNITIVE DEMANDS**

Finally, the effects of intensive learning (often under adverse conditions) are easy to overlook. For many students in the course, you are learning a great deal of new information in a short amount of time. Take care of yourself by getting adequate rest, exercise, and pacing yourself in the activities that fulfill the course requirements. Solid psychological conditioning will better enable you to incorporate new information in the course, ultimately make safe, sound decisions in the mountains.

**DATES TO REMEMBER:**

* Belaying, Prusiking, and Leader-Tie off with escape must be passed by the end of Field Trip 2.
* 10 Essential Systems must be passed by the beginning of FT 3.
* Practice your knots and attempt to pass the Knot Test as early in the course as possible. The Knot Test must be passed by the end of Field Trip 3.
* Two conditioners must be passed; One prior to FT 3 and the second prior to FT 5 or any climbs. Sign up for these ASAP.
* Sign up for the Navigation and WFA courses early. They fill up, and students miss out on graduating every year.

**Classroom Session # 3**

**Snow Travel, Snow Camping, Crevasse Rescue Intro**

|  |
| --- |
| **Classroom Session 3 Readings and Topics** |
| **Snow Travel and Camping** |
| **Mechanics of Belay and Crevasse Rescue**  **Mountain Rescue, Safety** |
| **Field Trip Leader Q & A and Information (Field Trip #3 – Winter Overnight)** |
| **Date: Wednesday March 18, 2020**  **Time: 7 PM**  **Duration: Approximately 3 hours**  **Location: Tacoma Mountaineer Clubhouse 2302 North 30th St, Tacoma**  **NOTE: Please bring climbing harness, webbing, carabiners, and belay device** |
| **Assigned Reading** (complete prior to Lecture #3) |
| ***The Freedom of the Hills, 9th edition***   |  |  | | --- | --- | | Snow Travel and Climbing | Chapter 16 | | Glacier Travel and Crevasse Rescue | Chapter 18 | | Belaying | Chapter 10 | | Safety | Chapter 23 | |  |  |   ***Basic Rock & Glacier Climbing Course Manual***  All Lecture #3 Material |
| **Additional Resources**  Avalanche Resources:  Northwest weather and Avalanche Center:[**http://www.nwac.us**](http://www.nwac.noaa.gov/)  Northwest Avalanche Institute**:** [**www.avalanche.org**](http://www.avalanche.org)  Weather Forecasts:  Mountain Weather Forecast Resource  [**http://www.mountain-forecast.com/**](http://www.mountain-forecast.com/)  NOAA Mountain Weather Forecast [**http://www.wrh.noaa.gov/sew/forecast03.php**](http://www.wrh.noaa.gov/sew/forecast03.php)  ***Books:***  **Staying Alive in Avalanche Terrain** by Bruce Tremper, Mountaineer Books, 2001  **Mountain Weather** by Jeff Renner, Mountaineer d  **The ABC of Avalanche Safety** by E.R. LaChapelle, Mountaineer Books |

**SNOW CLIMBING AND CAMPING**

PLANNING AND PACKING

Spending the nights or many nights in the wilderness requires more time for planning. Necessary research needs to be done on the area, conditions, and weather, and preparations need to be made for shelter, food, clothing and equipment. Snow camping in winter conditions requires far more thought in planning due to the harsher weather conditions and additional consideration needed to keep you warm and comfortable. Many campers like to have the comforts of home but since you will be carrying everything on your back, you will need to streamline what you take with you without compromising your safety.

The most efficient way to streamline gear is to plan with your team/tentmate(s) in advance, and coordinate shared equipment (tents, stove/pot/fuel, water purification system, snow shovel, and other group gear). Make a checklist of each of the items and dole out the group gear amongst the team members (many partners do it by weight).

Try packing a few days before the trip to see if all fits in your pack. You may want to reread *Freedom of the Hills* 9th Edition Tips on packing (page 33) to see how to distribute weight. Make sure you have your pack properly fitted and adjusted, and then try walk around with it loaded. Make sure it is within the weight you can carry comfortably for a long distance. If everything does not fit or the load is too heavy, go through the checklist and identify what you can leave out or substitute with something smaller or lighter, without sacrificing safety.

It is a good practice to try out any new (and rented) equipment, such as tent, stove, and water filter, while you are home (BEFORE the trip) so that you can make sure you know how to use it, it is in working order, and you will be able to set it up quickly even after a long hike as the temperature drops. When you get back home after each trip make notes on your checklist, what worked and what didn’t, and what could be improved; it will be extremely useful when you prepare for the next camping trip.

CLOTHING

Your body essentially acts as a furnace, producing heat through chemical reactions (food) and activity. As you increase your physical activity your body increases heat production; when you decrease or stop activity the body decreases heat production and starts to lose heat. You will need to find/figure out/pack a layering system that will keep you cool and dry during physical activity, but warm at rest. The key to staying warm in winter conditions is to stay dry. You will typically want to start with a moisture wicking base layer and a shell during heavy physical activity, and add mid insulating layers as physical activity decreases or temperatures drop. When at rest, put on additional layers before you become chilled since it is more difficult to get warm again once your core temperature drops. When you/the team is ready to be active, take off layers until you feel just cool, since your body will start producing heat as soon as you start moving, and you absolutely do not want to break a sweat. When you get into camp, try to change into dry clothes as soon as possible. This will help you stay warm for the rest of the evening and into the night. NOTE: even sweaty cotton underwear and bras make it harder to stay warm. It is not recommended to wear cotton on backcountry camping trips.

FOOD AND WATER

Take foods that are light weight, compactable, simple to prepare and require minimal clean-up. Prepackaged or repackaged foods save on both bulk and weight. For some climbers, “carb loading” can give you a head start on your energy needs, it’s a good idea to eat a carb heavy breakfast. Be as creative as you’d like when planning your meals— but make sure they work at home before trying them out on a trip.

It is important to stay hydrated during an outing, and this can be even more difficult when the temperatures drop. Many climbers use an insulating Nalgene sleeve to store water, in their pack or even better in your jacket. Make sure to store the Nalgene upside down, so if the water does begin to freeze, it freezes at the bottom of the container. If you prefer a bladder and tube system, make sure you use an insulating tube sleeve and store the mouth piece in your jacket to keep it from freezing.

Either keep water inside your tent at night, or bury it in the snow. Snow acts as an excellent insulator and can keep water from freezing, but make sure you mark where you buried it.

CAMPING

If there is an adequate amount of snow and you have a lot of time you can build snow shelters, such as igloos, snow caves or snow trenches. They tend to be more secure and warmer in wintery condition than tents, but take a lot of time to build. A tent for winter camping needs to withstand both wind and snow and it must have a roof line that allows snow to fall off. Four-season tents generally meet these criteria. A ground sheet is useful to help protect the tent floor (the snow underneath can turn to ice from your weight and body heat and sharp ice can tear the tent floor). Anchor the tent using snow tent stakes or Deadman anchors.

Some considerations in choosing a winter snow camp:

* Camping regulations
* Other campers
* Wind – avoid ridge tops and open area where wind can blow down tents or create drifts
* Be aware of dead branches hanging in trees (“widow makers”)
* Avoid low lying area where the coldest air will settle
* Select sites that do not pose any risk from avalanches
* Exposure – south facing areas will give longer days and more direct sunlight
* Water availability (lakes or streams nearby) – always camp 200 ft. or more from a body of water

When packing up and leaving the campsite, work together to camouflage the camping areas, so it will be undetectable after 2-3 inches of snow has fallen. Pick up any trash, collapse snow structures, cover up discolored snow, and fill snow pits that can pose cave-in hazards for other visitors and wildlife.

SLEEPING, SLEEPING BAGS, AND INSULATION PADS

You will probably wake up a number of times during the night. This is normal at altitude and in cold weather. Your body needs to change positions to allow for circulation to compressed tissues and to move around a bit so that muscle movement generates heat.

Some tips to stay warm and get a good night rest:

* Use the restroom before you get in your tent, so you don’t have to get up and possibly go out into the cold at night. You may want to use a “pee bottle” in your tent– make sure you mark it well.
* Brush off any snow from your boots or packs with a whisk broom so you don’t bring any snow inside the tent.
* Put water bottles with hot water or tea (to drink in the morning) into your sleeping bag. Put them in a dry sac in case they leak.
* Remove any wet/damp layers and replace them with dry ones, particularly socks. Wear layers of dry clothes for the night.
* Wear a hat, fleece booties, thin gloves and scarf around the neck to help keep you warm.
* Get warm before you get into your sleeping bag. Do some jumping jacks, etc. .
* Pre-warm your bag with your body (get it nice and toasty). Place damp items in the sleeping bag with you near your trunk. This will help dry them overnight.
* Sleep with your face out of the bag. This reduces moisture build-up inside the bag.
* Ventilate the tent so moisture can escape.
* Bring ear plugs, people may snore at elevation

Sleeping bags for snow camping should be rated to temperatures below what you will likely experience if you want to be comfortable. It is recommended to use two insulating pads when camping on snow, they are indispensable for sleeping comfortably at night.

## SAFETY

It cannot be emphasized enough that safety should be the first priority for everyone involved in climbing activities. It is your individual responsibility and cannot be delegated to the leaders or other team members. Practice safety by doing the following:

* **Memorize and follow the Mountaineers’ Climbing Code**.
* Prevent mishaps: be alert and speak up about potential hazards, both objective and subjective.
* Be responsible by physically and mentally preparing yourself for the climb. Do not climb past your limits.
* Make sure you have learned and mastered the technical skills needed to effectively preform on a climb.
* Learn the proper use of your equipment and keep it in good condition. Make sure the equipment fits before leaving for field trips and climbs. Always follow the manufacturer’s instruction on how to use equipment.
* Bring and know how to use your 10 Essentials

On all climbs make sure to:

* Check and double check harnesses, tie-ins, anchors, etc.; both yours and your partners.
* Keep yourself attached to an anchor in exposed places until you are on belay or rappel.
* Practice good rope management.
* Stay alert and learn to recognize potential objective hazards and ways to mitigate them.
* Bring and **use** appropriate clothing and equipment. **Always wear a helmet.**

YOU are responsible for preparing and taking care of yourself to minimize risk and prevent mishaps. If you have information or thoughts that might be of value, share it with the party, especially with the leader. You and your fellow climbers share in the responsibility for the climbing party with whom you travel.

## First Aid, Accident Response and Alpine Rescue

When traveling in the mountains, first aid takes on an entirely new meaning. Here professional medical help is hours or days away. The medical supplies that are available are those that you have with you, and you are your own rescue team. Therefore it is important to understand the 7 steps of accident response in case someone becomes injured in your party. They are listed below, but make sure to use *Freedom of the Hills* to understand the details of each step.

* + - 1. Take charge of the situation
      2. Approach the patient safely
      3. Perform emergency rescue and urgent first aid
      4. Protect the patient
      5. Check for other injuries
      6. Make a plan
      7. Carry out the plan

When an emergency does arise, and you cannot move the victim or need help, it is important to know how to contact and interact with local authorities vs search and rescue (SAR). Start by calling 911 or using the help mode of a personal locator beacon that you are carrying with you. Search and rescue will need to know specific information to be able to quickly and effectively extract the injured climber and party, but initially called local authorities might not completely understand the information you are giving them. Make sure to know what information to provide **and** to whom.

With all this in mind, and the fact that this is such an important topic, all Mountaineer Basic Climbing Courses require completion of a Wilderness First Aid (WFA) or similar alternate course. It will contribute as much to the well-being of the group as proper knowledge of belaying, rappelling, crevasse rescue, etc. However, make sure to be able to recognize the signs and symptoms and know how to prevent and/or treat common mountain maladies, such as:

Hypothermia Snow Blindness Strain

Heat Exhaustion Acute Mountain Sickness Sprains

Heat Cramps High Altitude Cerebral Edema Blisters

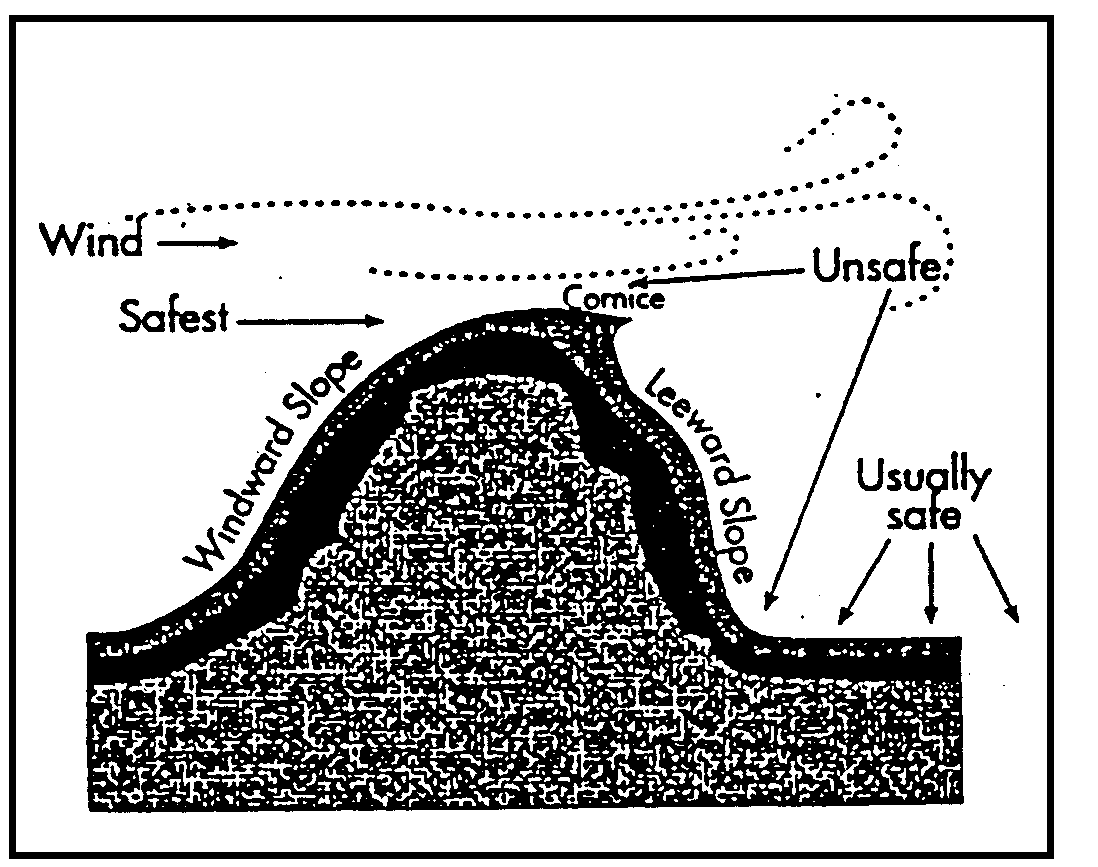
Frostbite High Altitude Pulmonary Edema Lightning Strikes

Dehydration Immersion Foot Contaminated Water

## AVALANCHE HAZARD, AWARENESS & AVOIDANCE

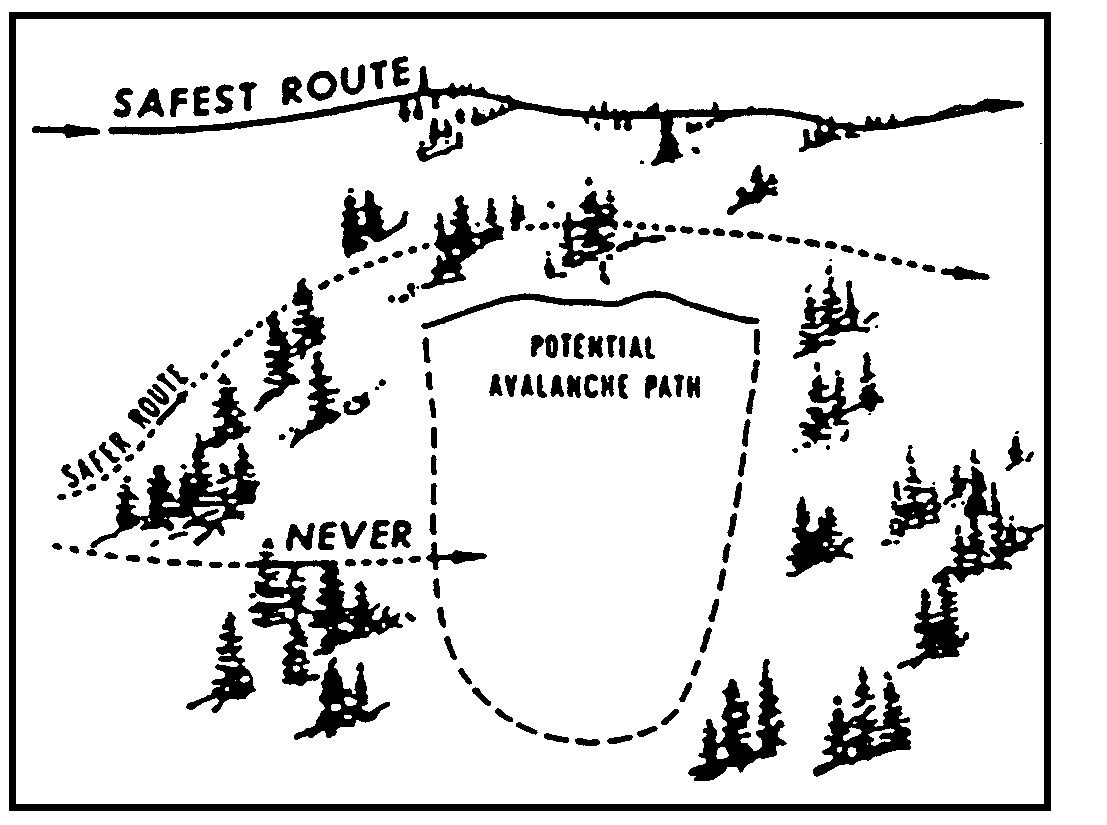
Snow avalanches are complex, natural phenomena. Experts do not fully understand all of their causes. No one can predict avalanche occurrences with certainty, but we know that avalanches can have a tremendous force and are life-threatening to snow travelers year-round.

The more time you spend skiing, snowboarding, snow shoeing, snowmobiling, and enjoying other snow activities, the greater your chances are of being caught in an avalanche. Take the time to learn and understand avalanche safety by enrolling in an AIARE course. Knowledge of avalanche terrain and good route selection can help you avoid being caught in an avalanche. Check the avalanche hazard forecast ([www.nwac.us](http://www.nwac.us)) for the area in which you plan to travel. Think about the changing weather, terrain and snow pack conditions around you *AND* ***constantly update your assessment of the avalanche hazard!***

*ROUTE SELECTION AND PRECAUTIONS*

**Avalanches don't typically happen by accident** and most human involvement is a matter of choice, not chance. Hence, always practice safe route finding skills, be aware of changing conditions, and carry avalanche rescue gear. Learn and apply avalanche terrain analysis and snow stability evaluation techniques to help minimize your risk. Remember that avalanche danger rating levels are only general guidelines.

The safest routes are on ridge tops and slightly on the windward side, away from cornices. Windward slopes are usually safer than leeward slopes. If you cannot travel on ridges, the next safest route is out in a valley, far from avalanche paths and other slopes.

Avoid cornices. Move towards ridge tops by detouring out of the path of cornice snow pack.

If you must cross a potentially dangerous slope, stay high and near the top. If you see cracks, or avalanche fracture lines in the snow, avoid them and similar slopes.

Only one person at a time should cross a potentially dangerous slope. All other people in the party should watch. Before crossing the slope, remove ski pole straps, ski safety straps, and loosen all equipment, (except small backpack, which can act as a floatation device) so they may be discarded should a slide be triggered. Fasten all clothing, put on your hat and gloves, and raise your parka hood.

Each person in the party should carry, and know how to use, an avalanche transceiver, sectional probe poles, and a shovel.

If you must ascend or descend a dangerous slope, go straight up or down; do not traverse back and forth across the slope. Take advantage of dense timber, ridges, or rocky outcrops as “islands of safety.” Use them for lunch and rest stops. Spend as little time as possible on open slopes. As the hazard increases, route selection becomes more important

**AVALANCHE SURVIVAL**

***If You Are Caught in an Avalanche*:**

* Discard all equipment and get off and move away from snowmobiles you may be riding.
* Make swimming motions. Try to stay on top; work your way to the side of the avalanche.
* Before coming to a stop, get your hands in front of your face and make an air space in the snow. If you know you are close to the surface, try to stick a hand or foot out of the snow so you can be easily found.
* Try to remain calm, and breathe slowly.

***If You See Someone Caught in an Avalanche*:**

* Mark the location where you last saw the victim.
* Search directly down slope, below where the victim was last seen. If the victim is not on the surface, scuff or probe the snow with a ski pole or probe pole, or use avalanche transceivers if the victim is wearing one.

***You Are the Victim’s Best Hope for Survival*:**

* Do not desert the victim by going for help, unless help is only a few minutes away. Remember, you must consider not only the time required for you to get help, but also the time required for help to return.

***First Aid*:**

* Treat for suffocation, shock, impact injuries, and hypothermia.

***Time is the Key to Survival*:**

* After 1/2 hour, the buried victim has only a 50 percent chance of surviving.

**DATES TO REMEMBER:**.

* 10 Essential Systems must be passed by the beginning of FT 3.
* Practice your knots and attempt to pass the Knot Test as early in the course as possible. The Knot Test must be passed by the end of Field Trip 3.
* Two conditioners must be passed; One prior to FT 3 and the second prior to FT 5 or any climbs. Sign up for these ASAP.
* Sign up for the Navigation and WFA courses early. They fill up, and students miss out on graduating every year.

# Classroom Session #4

**Decision Making, Group Dynamics, and Climbing Classification**

|  |
| --- |
| **Lecture 4 Readings and Topics** |
| **Decision Making & Group Dynamics** |
| **Date: Wednesday, April 15, 2020**  **Time: 7 PM**  **Duration: Approximately 3 hours**  **Location: Tacoma Mountaineer Clubhouse 2302 North 30th St, Tacoma** |
| **Assigned Reading** (complete prior to Lecture #4) |
| ***The Freedom of the Hills, 9th edition***   |  |  | | --- | --- | | Leadership | Chapter 22 |   ***Basic Rock & Glacier Climbing Course Manual***  All Lecture #4 Material |
| ***Additional Resources***  See handouts |

**CLIMBING CLASSIFICATION SYSTEMS**

It is important to understand how climbs are classified so you can better assess the climbs you are interested in, and your preparedness before requesting permission. Remember, your climb leaders are not guides, it is not their job to make sure you accomplish the climb. They are expecting you to know your skills and to be physically and psychologically prepared for the goal.

**THE NATIONAL CLIMBING CLASSIFICATION SYSTEM (NCCS)**

The NCCS assigns grades to describe the overall difficulty of a route in terms of time and technical route difficulty, taking the following factors in to account: length of the climb, number of pitches, average pitch difficulty, difficulty of the hardest pitch, commitment, route-finding problems, and ascent time. It should be emphasized that with the increasing grade, the increasing level of psychological preparation and commitment is necessary. This grading assumes the party is competent, psychologically and physically, and ready for the expected level of climbing.

Grade I: Normally requires several hours, can be of any technical difficulty

Grade II: Typically half a day, any technical difficulty

Grade III: Requires a day to do the technical portion; any technical difficulty

Grade IV: Requires a full day for the technical portion; the hardest pitch is no less than a 5.7

Grade V: Requires a day and a half; the hardest pitch is at least 5.8

Grade VI: A multiday excursion with difficult free climbing and/or aid climbing

Grade VII: Requires at least 10 days of suffering on a huge wall, in a remote area. Climbing grades are at least as difficult as VI, but other factors are increasing in intensity

## YOSEMITE DECIMAL SYSTEM

This system categorizes terrain according to the techniques and physical difficulties encountered during a climb.

Class 1: Hiking on a trail.

Class 2: Simple scrambling, with the possible occasional use of hands.

Class 3: Scrambling; hands are used for balance and a rope might be carried.

Class 4: Simple climbing, often with exposure. A rope is often used, and a fall could be fatal. Natural protection can typically be found.

Class 5: Rock climbing, involves exposure. A rope is used, belaying and protection (natural or artificial) is used to protect the leader from a long fall. Class 5 climbs are rated 5.0-5.15.

**THE MOUNTAINEERS RATINGS**

The Mountaineers use the above rating systems to classify all activities into categories: hiking, scrambling, climbing, etc.

* Hike – Grade I, Class 1
* Scramble – Typically Grade I, can be Grade II, Class 2-4
* Basic Alpine – Typically Grade I, can be Grade II, Class 3-5
* Intermediate Alpine – Typically Grade II or higher, Class 3-5.

**DIFFICULTY RATINGS**

Activities are further broken down into difficulty ratings, for purposes of the Basic Climbing Course, you are interested in difficulty ratings of: Basic Alpine, Basic Glacier, and Basic Rock. The difficulty rating will often also include a strenuousness and technical rating. The technical difficulty and strenuousness is determined by comparison of the particular climb to other basic climbs. The scale is from 1 to 5, with 1 being the easiest and 5 hardest.

* Technical rating : refers to difficulty of the climbing moves and exposure
* Strenuousness rating: refers to the level of conditioning required, both aerobic and strength.
* Difficulty type (rock, glacier, or alpine) is what you get credit for by completing the climb.

**LEADER RATINGS**

New to the website is the leader rating. For a leader to list a climb, they have to put in a rating. There is not currently a standard set as to how a leader should rate a climb, but it is assumed they rate it based off of the overall difficulty of the climb and pace they want to keep. We suggest, that you take the leader rating lightly, and if you are concerned with the rating and your abilities, email the leader.

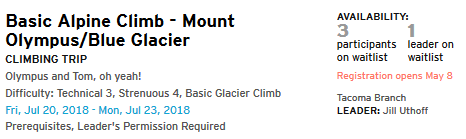
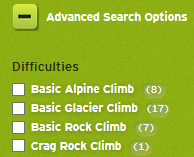
**BASIC CLIMBS**

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### NAVIGATING THE WEBSITE - FINDING BASIC CLIMBS

Step 1: Click the Climbing box under the Find Activities Page (see picture to the right)

Step 2: Scroll to the bottom of the Find Activities bar to the “Climbing Categories” heading. Click Basic Alpine Climb – this will pull up all basic glacier, rock and alpine climbs.

ALL listing will pull up to the right of the activities bar (Ex. Listing, see image below). Listing will show: the name of the peak, the route, number of available spots for leaders and participants, the name of the leader, the branch the leader is from, and the date(s) of the climb. Most listing will show the difficulty rating (type of climb you get credit for, strenuousness and technical rating). Some of the listing will have a short “description” of the climb, which is input by the leader, so will change from climb to climb. Ex. “Olympus and Tom, oh yeah!”

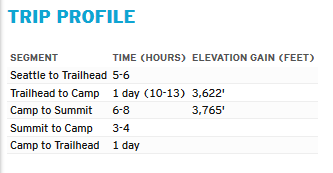
To look for a particular type of climb (basic rock, alpine, or glacier) go to the Advanced Search Options button and click what you are looking for.

To look for a climb by Branch find the “With this branch…” heading and click the branch you are looking for. The listings to the left will be all the climbs being led by leaders from the specified branch.

NOTE: It is important to mention that the same climb can be listed different ways (ex. Mount Olympus can be listed as a glacier climb or basic alpine climb- either way you get credit for a glacier climb). The listing is based off the way the leader chooses to list it, and this is beyond what you need to worry about. Either way, the climb will still show up in the listings even if you search for basic glacier climbs and it is on the website as a glacier climb.

**IMPORTANT INFO FOUND ON THE MAIN CLIMB PAGE**

Here is an example of the information that you can find on the website about basic climbs. Make sure you are paying attention to the following information:

* **Date(s) of the climb**
* **Difficulty -** tells you the type of climb you get credit for, and its strenuousness/technical difficulty compared to other basic climbs. Remember however, that strenuousness and technical difficulty can be subjective qualities. They can also change with season (spring, summer, fall), but will remain the same on the website.
* **Mileage**
* **Elevation Gain**
* **Leader’s Notes:** ALWAYSread **all** the leader’s notes prior to signing up for a climb. They will put any information that they think you need to know about the climb and/or signing up in here. Follow the leader’s notes.
* **Trip Reports:** Can give you good beta on the climb, and will typically discuss route conditions and concerns.
* **Roster**: Look to see who else is signed up for the climb.
* **Required Equipment**: This list is a recommendation; the leader should send out an email with the required gear.
* **Links to full route/place details**: **ALWAYS** look at this information. This page has A TON of useful information:
  + It typically has a good description of the climb
  + Driving directions
  + Approach
  + Ascent Route
  + Descent Route
  + Trip Profile
  + Equipment
  + Important Notes about the climb
  + Weather
  + Location of the climb
  + Red Tape – parking passes needed or park entrance fees
  + Maximum Party Size

**SIGNING UP FOR BASIC CLIMBS**

* Watch the website, climbs are listed all year long. Don’t wait until the last minute/end of the season to try to get on/schedule your climbs. Leaders don’t like to go out when weather is crappy, they don’t care that you might need the climb to graduate.
  + Basic Alpine Climbs – typically March/April to Sept/Oct
  + Basic Rock Climbs – typically May to Early September, or as long as it stays dry
  + Basic Glacier Climbs – typically May to Mid-September, depends on the amount of snow that year
* Sign up for the waitlist, there is a good chance you will get on the climb. People’s schedule change with work or family emergencies, they get hurt and can’t go, they get sick, etc. Often you can get on a climb last minute by being on the waitlist. If you don’t want to get on a climb last minute, cancel yourself from the waitlist.
* Many climb leaders require leader’s permission, to sign up for their climb so be sure to obtain the climb leader’s permission or you will likely be dropped from the climb.

NOTE: In the email to the leader (especially a leader that you do not know), it is helpful to include:

* + - Mount Si or other conditioner time with “x” amount of weight.
    - Let them know you are a Basic Student from the Tacoma Branch (or Grad after you complete the course).
    - Other climbs you have successfully completed, including personal climbs.
    - Why you want to do the climb.
* Climb leaders may have additional restrictions which they will typically explain in the leader’s notes section of the climb. Make sure to read all the leaders notes before you request permission for a climb.
* If there is a Mentored Leader, email them as well asking permission.
* Make sure you understand what you are signing up for. Look at the difficulty rating, mileage, elevation gain, read trip reports. A lot of times the leader will let you know if they plan on moving quickly and/or if the climb is more challenging because they are doing it in a day or shorter time period than the climb is typically done. Make sure you can accurately assess whether your conditioning/physical ailments will allow you to do a climb of the nature.
* You can request permission for climbs prior to passing required field trips, however participation on the climb is always contingent on you passing the required field trips.

### GENERAL INFORMATION AND GUIDELINES

* Climbs for course credit must be done with different approved climb leaders and be officially listed on the Mountaineers’ website. This helps expose students to a variety of climbing styles and allows for them to be assessed by various leaders.
* Students should be aware that some leaders may be leading routes with which they are unfamiliar and have never attempted. Leaders will typically inform students prior to the climb when such routes are to be taken. During climbs, students should be prepared to assist in route finding and other tasks as requested by the leader.
* Climb leaders will hold pre-climb meetings by phone, email, or in person. Failure to attend or respond quickly to a pre-climb meeting may result in being dropped from the climb.
* Successful completion of a Basic Climb for the Tacoma Mountaineers, requires that the students summit. The leader’s analysis of successful completion will include the safety, skills, conditioning, and attitude of the student.
* Students are typically expected to carry ropes and other group gear as assigned by the leader. Refusal to carry such group gear may result in the student not receiving credit for the climb or not being allowed to go at all.
* **Keep In Mind That All Of Your Trips Are Led By Volunteers** **-** Without their help, we could not offer you the chance to go on these climbs. You may not always agree with the leader, but on a climb, the leader(s) decisions are final.

### YOUR RESPONSIBILITY PRIOR TO AND ON CLIMBS

**Be Knowledgeable**

* Leaders are not guides. You should be looking at weather, finding your own climb beta, have route information, maps, and GPS tracks. Be a responsible member in the climbing party.
* Have a general understanding of the rigorousness and exposure on the climb.
* Have a good self-assessment of your (psychological preparedness) risk tolerance compared to the exposure on the climb. If you are unsure, have a discussion with the leader.
* Review your skills (ie how to tie into a rope, how to set up a rappel/belay, how to coil the rope, etc.), and if you don’t remember, read about it or look it up prior to the climb. Ask the leadership team if on a climb.

**Conditioning:**

* Have passed a conditioner hike, and maintained adequate conditioning to be prepared for the climb.
* Have a good self-assessment of whether or not a climb is in-line with your current fitness level and speed. If you are unsure if you have proper physical conditioning for a climb, ask the leader for their expectations. 

**Equipment:** Bring the proper equipment.

* The equipment you need for a particular climb should be covered in a pre-climb discussion and/or it is listed on the website. If you are unsure, ask the leader and/or just bring it.
* When packing, place the equipment you will need where it is accessible, not at the bottom of your pack.
* If you rent equipment, such as crampons or a tent, be sure to have them properly adjusted or practice setting it up **prior** to the climb.
* Let the leader know what you have for group gear (ie., jetbol, not just “stove”) in the pre-climb info email. This will help the leader expedite the pre-climb discussion.

**Be Courteous:**

* **Be Timely: To be early is to be on time. To be on time is to be late. To be late is to be left.**
* **Respect Others:** Everyone is going to find out that at times they may be a little apprehensive about a part of the climb. Always help, support, and encourage others.
* **One Team:** You are responsible for each other – Take care and help each other out! Pay attention and make sure everyone is adequately eating and drinking. The climbing party will always stay together unless there is an emergency.
* **Carpool:** Remember to reimburse the driver for gas. 14 cents/mile per person is recommended. It is common practice to stop on the return trip for a meal. If you drive and must return quickly after a climb, inform any potential riders that you do not intend to stop on the return trip.
* **Cancellations:** Cancel at the earliest possible date. Your fellow climbers are counting on you. Timely notification also allows another climber to take your place on the climb and helps avoid the cancellation of climbs.

**DATES TO REMEMBER:**.

* Conditioners must be passed, prior to FT 5 or any climbs.
* Lead belay and Rappels skills test are done at FT 5, make sure you are working on those skills.
* Start thinking about getting those stewardship activities completed. Summer is upon us and there are usually more fun things to do than stewardship activities.
* Sign up for Nav or WFA, if you have not already.

# Classroom Session #5

**Glacier Travel & Crevasse Rescue, Weather**

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| --- |
| **Classroom Session 5 Topics** |
| **Glacier Travel** |
| **Crevasse Rescue** |
| **Weather** |
| **Field Trip Leader Q & A (Field Trips 6P, 6 &7)** |
| **Date: Wednesday, May 13th, 2020**  **Time: 7 PM**  **Duration: Approximately 3 hours**  **Location: Tacoma Mountaineer Clubhouse 2302 North 30th St, Tacoma** |
| **Assigned Reading** (complete prior to Lecture #5) |
| ***The Freedom of the Hills, 9th edition***   |  |  | | --- | --- | | Glacier Travel & Crevasse Rescue  Mountain Geology  The Cycle of Snow | Chapter 18  Chapter 26  Chapter 27 | | Mountain Weather | Chapter 28 |   ***Basic Rock & Glacier Climbing Course Manual***  All Lecture #5 Material |
| ***Additional Resources***  [(click for link)](https://www.youtube.com/watch?v=aK6L0XgT3qg&list=PLx0eV4pykXick_2b_kLBZC8lNXmxiyC3w) “The Alpine Geek: Windy.com Tutorial” (~30 minutes, great overview of a powerful forecasting tool!) |

## GLACIER TRAVEL

Glacier travel employs all the techniques used in snow travel with one major addition, navigating crevasses. Crevasses are vertical ice trenches in the snow, which are very hazardous and ready to trap the careless climber. They tend to stay hidden until later in the season when the snow melts and collapses into the crevasse. If the snow coverage is thick and strong you will likely walk right over the crevasse and never know it. Sometimes a visible crevasse will have a snow bridge that you can cross if it’s strong enough, but the real hazard is the crevasse with just a weak thin covering of snow that will not support a climber’s weight. It is not always the lead climber that breaks through, it may be the second or third or even the next rope team which h is why the Mountaineer’s code includes **always rope- when traveling on a glacier** and keep the rope fully extended. Ideally there are three climbers per rope and at least two teams, so if you have to perform a rescue, it is much faster and easier. While on the glacier, look for evidence of crevasses as you move. Expect them. Belay, or be prepared to arrest, when moving a team over snow bridges. Know how to perform a rescue and be equipped to rescue in various ways. 

### WHAT TO EXPECT ON A GLACIER CLIMB

The following is a general outline of what to expect and what is expected of you on a glacier climb. Glaciated peaks of the Northwest are big (i.e. Mount Rainier, Mount Adams) and if not big, they can be very remote. Glacier climbs are not typically quick and easy. Nearly all take a minimum of two days. Glacier climbs are complex events. Each member of the climbing party must be ready and understand the goals and the team must plan and organize carefully. If someone forgets an item of equipment, it can potentially stop the trip for the whole team. The following is a breakdown of events involved in planning for a typical glacier climb.

**Pre-Climb Planning:**

Pre-climb planning, primarily done by the leader, typically starts several weeks or months in advance. After deciding on a peak and route, leaders, can better understand the various technicalities of the route, and with those details they can start to form the team.

In selecting the team, the leader will often screen participants to ensure they are competent, comfortable on specific terrain and/or have a specific fitness level due to the speed needed to accomplish the goal (this is where reading the leader’s notes is important).

About two weeks out, the leader will start looking for more recent beta on the route/conditions. Leaders will assess what gear each member and/or the group needs to bring or special circumstances/considerations about the route (i.e. will there be running water or do they need to plan to bring x amounts of stoves and fuel for x number of climbers. Is there ice on the summit ridge, so we need x number of ice screws? If there is ice on the ridge will it be safe to take the team to the top or should they ditch this plan and try something else?). In addition, the leader will start confirming participation on the climb, and may start collecting emergency contact information, tent partner requests, and will try to understand what each participant has to contribute for group gear.

About a week out, the leader will start to distribute and finalize the details of the climb: climb itinerary, tent partners, personal gear, group gear, logistics, and potential concerns. They will also be monitoring the weather, to sometimes make a go/no go last minute decision. Leaders vary in how they plan their climbs. Some go into great detail and others are more general in their approach. Your job in preparing for the pre-climb is to do your planning as far as you can, go over your equipment status, identify concerns you have about the climb, and be ready with a list of questions.

**Things You Should Know After Good Pre-Climb Planning:**

1. Who is in the party and who is your tent mate
2. The climbing route, itinerary, and any route concerns or considerations
3. The equipment you must have for the climb and what group gear you are required to bring
4. Meeting times and locations for carpooling to the trailhead
5. The leader’s expectations for the climbing party
6. Weather conditions

**The Night Before:**

This can be a traumatic experience the first timer. Your equipment will not fit in the pack, and when you finally get it all in, you can barely lift it and are worried about keeping up with the group. Don’t give up, persevere and it will work out. You can avoid some of this heartburn with a few practice sessions a day or two in advance, and if you are still worried then, contact the leader to find ways to save on size or weight.

**The Trailhead:**

Arrive early or be ready when you arrive. Don’t leave half of your packing to be done at the trailhead (unless you plan to be very early). The leader will have some last minute instructions and equipment checks to review everyone has required gear. As a student you will have the honor of carrying a rope and possibly other group gear. Don’t worry, if you carry it in, someone else will carry it out.

**The Approach:**

The approach is the hike from the trailhead to base camp for glacier climbs, or to the base of the first pitch for rock climbs. Approaches are always uphill with a full and heavy pack and cover a good amount of distance and elevation gain. They can include trails, but are mostly off trail scrambling, and/or go through snow fields, and in some cases, involve roped glacier travel. The leader will want to arrive at base of the first pitch early enough for the whole group to climb up and rappel down. On busy routes, leaders need to plan for enough time if there is climbing traffic. On glacier climbs, the leaders will want to get to camp early enough to get everything set up and prepare for summit day.

**Base Camp:**

Arrival at base camp marks the end of the approach. You will probably be tired, hungry, and sore, but remember this is not a guided tour. Don’t wait for the leader to tell you every detail of what to do. Grab a quick snack then, start:

* Filtering water or set up stoves to melt snow for drinking water and cooking.

NOTE: If you are carrying a stove, and snow needs to be melted for drinking and cooking: find a good spot, get the stove set up and start the process of making water **before** you do anything else. This will likely take a long time, so as others finish with their tent set up they can come take over melting water or set up your tent for you.

* Building tent platforms (for snow sites) and pitch your tent.
* Help others with their set up or filtering water.
* Change into dry clothes/Stay warm.
* After all the above is done start making dinner.

At some point (likely while everyone is enjoying dinner as all chores are done or being finished up) the climb leader will call a meeting or come around and make rope team assignments, confirm wake up and departure times for the next morning, and provide any final instructions. If you have questions or problems, talk to the climb leader, particularly if it’s something concerning you about your fitness for the next day’s climb. For a glacier climb, it is advised to lay out the rope, mark the tie-in spots and tie-on your prusiks in preparation for the next morning.

Before you get into your sleeping bag for the night you should know or have done the following:

1. Departure time, so you can plan your wake up time.
2. Alarm is set, or someone knows they are supposed to wake you up.
3. Who is on your rope team, your position on the rope, rope is set up and ready to go.
4. Any potential concerns about the route.
5. Your water bottles are full (not left out in the cold), and your breakfast is ready for quick preparation.
6. Your head lamp, harness, and chest sling are nearby and ready, and crampons fit your boots.
7. Your summit pack is mostly ready (you have food and clothing not being worn packed).

If you have all of the above in hand, you’re pretty well set. If not, don’t go to bed until it’s done. Also, if you tend to be slow, it’s your responsibility to get up a little earlier to make sure you’re ready on time. Do not leave the team waiting for you.

**Summit Day:**

Summit day starts **early**. Normally, wake up time is between midnight and 3 AM, with departure an hour later. Earlier start times mean it’s safer to travel on a glacier in the early hours when the snow is frozen. Snow bridges are stronger, and there is less of a chance of snow/ice or rock fall from higher on the mountain and avalanche hazards increase on the higher peaks after late morning. It is also easier and faster to walk on a hard snow surface. Summit days are generally long days!

A few notes on summit day events:

1. **Wake Up On Time:** When it’s wake up time you will feel lousy and feel like you didn’t sleep at all. This is normal, and get up and get moving!
2. **Departure Time: Don’t waste time!** Your goal is to have you and your gear ready, and to be tied-into the rope at your spot by departure time. Don’t make the group wait for you.
3. **Summit:** The summit means you are halfway there! Depending on the leader and prevailing conditions, your stay at the top may be brief or longer. The leader will let you know. On the way down use caution. Stay alert.
4. **Eat and Drink:** you will likely not be very hungry or thirsty in the morning. Eat and drink anyway. You are using an enormous amount of energy at high altitudes. Don’t bonk.
5. **Return to The Trailhead:** Have a change of clean dry clothes at the car. It will make the trip home much more pleasant for you.
6. **Drive home:** Expect your climb and drive home to take ALL day**.** Do not make afternoon or evening plans. If the hour is not too late, most climbing teams will arrange to stop for dinner as a group on the way home. If the hour *is* late, be safe – have some caffeine, or stop for a nap rather than driving exhausted.

**CREVASSE RESCUE**

Ideally students will travel in ropes teams of 3 (one leader and two basic students), but on occasion rope teams may be 4 persons (one leader and 3 basic students). For these reasons and simplicity, we will only practice crevasse rescue in teams of 3, with 2 or more rope teams, and always assume that an end climber fell into the crevasse. However, make sure you know crevasse rescue forwards and backwards because it is often the lead climber (the intermediate student or climb leader), and can be a middle climber who falls into the hidden crevasse.

**CREVASSE RESCUE RESPONSE**

Step 1. Stop the fall as quickly as possible.

Step 2. Set up a bomber anchor system.

Step 3. Communicate with the fallen climber (if possible).

Step 4. Devise a plan. There are a few options:

1. Self-rescue – Simplest/fastest method, however the fallen climber obviously has to be conscience and is able to ascend the rope via prusiking. Note: the team should help the climber as needed.
2. Multi-team rescue – more than one team is available to help in the rescue. This is typically the fastest way to get a fallen climber out of a crevasse, however it is very man-power intensive.
   1. Direct Pull: (fastest method) use this when there are many teams available, the rope is not entrenched in the lip of the crevasse, and the climber maybe unconscious.
   2. 2:1 (Single/C) pulley: use this when the rope is entrenched in the lip and the fallen climber is conscious
3. Team rescue 3:1(Z) pulley – The team members use a hauling system to pull the climber out. This is the slowest method of getting a team member out of a crevasse, but does not require the help of more people/parties. Use this method when there is only one team available for rescue, and if the climber cannot get out on their own (broken limbs or unconscious).

Step 5. Carry out the plan.

## MOUNTAIN WEATHER

Mountain weather is a primary concern to the mountain traveler. For a climber, some knowledge and understanding about mountain weather is more than just a convenience, it is a matter of safety. Weather is often the critical factor when making a go or no-go decisions before or during a climb In Washington State, the variability of the weather makes knowledge and observations an essential part of mountaineering. **Every member of a climbing party should be aware of the weather**, not just the leader. Continue to monitor the weather while packing, and try to check the weather the morning of the trip. Checking RELIABLE weather forecasts, topped-off with a good understanding of mountain weather can help make for a more safe and enjoyable outing. To better understand weather, you should concentrate on increasing your knowledge of:

1. Regional weather patterns
2. Effect of regional patterns on local mountain weather
3. Recognize how each of the following indicate weather change:
4. Sudden major change in wind direction
5. Sudden temperature change
6. Obvious barometric pressure changes
7. Changes in cloud strata directions
8. Cloud level rising/falling
9. How these weather influences drive changes in the snow pack causing avalanches.

METEOROLOGICAL FUNDAMENTALS

*From: National Avalanche School, 1981. Reno, Nevada*

**Some Rules of Thumb for Forecasting Mountain Weather without Weather Maps**

* Steadily falling barometric pressure usually indicates an approaching storm.
* Steadily rising barometric pressure usually indicates clearing.
* The second night of a storm is usually the coldest.
* Cirrus clouds can precede a storm by 24 hours or more. (A ring around the moon is caused by thin cirrus.)
* Thickening and lowering clouds (usually approaching from the west) indicate an approaching storm.
* Thickening mountain wave clouds indicate increasing moisture and winds aloft and a possible approaching storm.
* Frontal passage is often indicated by the lowest point of the barograph trace, a wind shift, and the sudden appearance of heavily rimmed snow crystals or graupel.t
* There is little chance of precipitation continuing when barometric pressure is 30.10 inches or higher.
* Thinning and lifting clouds indicate clearing weather.
* When the temperature during a storm drops to 5 ºF or colder, snowfall will rapidly diminish.
* On clear and calm nights, valley temperatures will be colder than ridge-top temperatures. (Inversion)
* Valley fog clearing before noon indicates fair weather.
* Snow plumes on ridges and mountain wave clouds indicate strong winds at high elevations.
* If the wind veers with height (turns clockwise; e.g., southwest at ridge-top, northwest aloft), expect a warming trend.
* If the wind backs with height (turns counterclockwise; e.g., west at ridge-top, south aloft), expect a cooling trend.
* If the wind veers with time (turns clockwise; e.g., south turning to west), expect mostly fair weather: low pressure is passing to the north.
* If the wind backs with time (turns counterclockwise; e.g., northwest turning to southwest), expect snow: low pressure is passing to the south.
* Temperatures change 3-5 degrees Fahrenheit every 1,000 feet in elevation change.

# Classroom Session #6

**Leader Halo, Signing up for Climbs, Leave No Trace**

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| **Classroom Session 6 Topics** |
| **Leader Halo** |
| **Leave No Trace** |
| **Date: Wednesday, May 20th, 2020**  **Time: 7 PM**  **Duration: Approximately 3 hours**  **Location: Tacoma Mountaineer Clubhouse 2302 North 30th St, Tacoma** |
| **Assigned Reading** (complete prior to Lecture #5) |
| ***Basic Rock & Glacier Climbing Course Manual***  All Lecture #5 Material |
| ***Additional Resources***  See supplemental website |

# FIELD TRIPS

The field trips are conducted for the purpose of giving you the opportunity to practice the techniques you have learned from the lectures, readings, and this manual in a controlled and instructed environment. If and when information in this manual differs from *Freedom of the Hills*, the information in this manual will be followed.

**Preparation:**

* Sign-up. Make sure you have signed up on the website.
* Study all required material prior to the field trip. The day will go much faster and you’ll learn much more. If you have a hard time reading and understanding, google the skill and watch videos.
* **Arrive early and be ready to start at the appointed time.** We plan to start the field trips at the appointed time, and no one leaves the field trip early.
* **Bring all the required equipment:** You will be graded on your preparedness. The needed equipment for each field trip is listed on the individual instruction sheets included here and in the gear matrix. Mark all your equipment with your name, or initials, or a marking that will stand up to abrasion and moisture.
* Come equipped with your own gear. Students must have their own individual equipment. You cannot share.
* Cotton is NOT allowed! Do not wear it to a field trip.
* Couples, relatives, and family members will be separated on the field trips and on all rope teams.
* **Carpool,** itis highly recommended. If you are driving a car to field trips (and climbs), please carry as many riders as possible. Each rider will contribute to car expenses, at the driver's discretion, up to 14 cents per mile, plus a share of park entry fees, when applicable.

**At Field Trip Site:**

* Follow Club Standards (see BCC Manual Lecture 1 material): They apply on all climbs and field trips. No pets are allowed on field trips.
* Follow instructions given and be courteous: The techniques taught on these field trips are accepted mountaineering techniques. There may be more than one way to do some of the things taught, but the techniques have been standardized for consistent instruction and safety. The instructors on these field trips are fellow Mountaineers who are volunteering their time to teach during these practices. Listen to their advice. If there are differences in instruction, ask the field trip leader.
* Individual Field Trip Progress: At the start of each field trip you will be given your field trip book. Ensure it gets signed-off by instructors as appropriate and turned in at the end of the day. At field trips, you will be responsible for your own progress from one practice station to the next. If you think you are not as far along as you should be by mid-day, talk to the field trip leader or an instructor for advice and help.
* Pace Yourself, Be Organized and Be Patient: On some field trips you will rotate through a number of stations. It is your responsibility to attend all stations and to do so without wasting time. It is a discourtesy to the instructors and your fellow students to hold them up because you’ve been wasting time.
* Do Not Litter and Follow the Leave No Trace Principles: The Mountaineers have a reputation for leaving an area much cleaner than we find it. It is one of the reasons we are allowed to use these practice areas year after year.
* Keep your pack and equipment with you wherever you go: You will need it. You are responsible for your own gear at all times.
* Lunch: There will not be a general break given for lunch. Eat when the time seems appropriate to do so.
* Safety: There is always a certain degree of risk in any mountaineering practice or climb. Pay attention and follow your instructors’ advice. Your safety and enjoyment, and that of others, depend on your cooperation.

**Departure:**

* **Plan to stay until the field trip is over.** We plan to start the field trips at the appointed time, and no one leaves the field trip until everyone is done. No one will leave base camp or the parking area for home until the leader gives the okay.
* Cleanup: It is a practice of the Mountaineers to try and leave a field trip site cleaner than when we arrived. If you finish all the required items for a field trip and others still have activities to complete, check with the Field Trip Leader for a cleanup assignment.
* Final Debrief: After the field trip is complete, the leader will do a final roll call to ensure we haven’t lost anyone. S/He will give their comments about the field trip and then will have the instructors do the same. Finally, s/he will open it up to the students for any comments, question and/or suggestions.

# FIELD TRIP #1 PREP – FUNDAMENTALS

###### Knots, Prusiking, Belays, Leader Tie-off and Belay Escape

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| --- | --- |
| **FIELD TRIP #1 PREP– FUNDAMENTALS PREPARATION** | |
| **Date/Time:** | Dates: February 19th or 20th  Starting Time: Arrive at 6:15 pm and be ready to go by 6:30 pm  Duration: Approximately 3 1/2 hours  **NOTE:** *Due to the amount of material that is covered and the time required to create your prusiks, this field trip may last as late as 11 PM.* |
| **Location:** | *Tacoma Mountaineer Clubhouse 2302 North 30th St, Tacoma* |
| **Purpose:** | * Have seat harness checked and approved * Practice knots * Construct leader tie-off, chest harness, and slings * Construct and size your Texas Prusiks * Practice prusiking – self crevasse rescue * Observe belaying and leader tie-off with belay escape demo |
| **Prerequisites:** | * Attend lecture #1. * Read Lecture 1 reading assignments |
| **Assignments:** | * Read *Freedom of the Hills*:   Basic Safety Systems………. ….. Ch 9  Belaying …………………………Ch 10  Glacier Travel ………………...…Ch 18, pgs 394-399, pgs 408-410   * Read Basic Rock & Glacier Climbing Manual Field Trip 1 Prep material * Practice tying the required knots * Watch this video on the basics of belaying (PBUS device method) : **http://blog.alpineinstitute.com/2013/10/toprope-climbing-belay-technique.html** |

|  |  |
| --- | --- |
| **EQUIPMENT**  **See Required Equipment FT1P on the Equipment Matrix** | |
| **Special Notes & Items** | Bring webbing and perlon materials as described in Required Equipment (Lec.1)  **Additional Equipment Notes**  1. Wear Mountaineering boots or sturdy leather hiking boots (NO Tennis shoes!!)  2. Wear appropriate clothing – dresses/skirts and shorts are not appropriate |

**PROCEDURE**

When you arrive you will be assigned to an instructor. Have your store cut webbing and perlon available to start constructing your Texas prusiks and slings. Throughout the evening, you will rotate through the different stations, and must complete all the stations before the end of the evening. At the end of the night, we will go through leader tie-off with belay escape one more time, allowing you to ask questions. NOTE: If you already have your Texas prusiks constructed, let the field trip leader know when you walk in.

**BELAYING AND LEADER TIE-OFF WITH BELAY ESCAPE DEMO STATION**

This station will be used as an introduction to rock climbing. Instructors will demonstrate flaking out and tying into a rope for lead climbing, attaching to an anchor, climbing signals, belay technique, and how to tie–off a climber and escape the belay in case of emergency. Pay attention. You will be practicing this at Field Trip 1 and tested on it at Field Trip 2.

## PRUSIKING – SELF CREVASSE RESCUE

## Here you will use your newly constructed Texas prusiks to simulate ascending a rope to get out of a crevasse. We will show you how you would tie in to the rope (for a glacier climb), and set up the prusiks, and then walk you through ascension. We will also resize your prusiks as needed. You will be practicing this tonight and at Field Trip 1 and tested at Field Trip 2.

## TYING SLINGS AND TEXAS PRUSIK STATION

Make sure you brought all your store cut webbing and perlon! We will start constructing your Texas prusiks and tying your slings, while letting you practice knots.

**Tie-Off Sling/Loop:** Take the two 4 foot sections of perlon and tie a loop using the double fisherman’s/grapevine knot. These loops/slings have many uses, however, for the purpose of the basic class and as a basic student, you will be using them as friction hitches.

**Single and Double Slings:** Tie one double and two single slings, using a water knot. The finished single slings should be 2 feet long and the finished double sling should be 4 feet long. Single and double slings are typically used on climbs to build anchors or to extend a piece of protection.

**Short Sling:** Using the 4-ft piece of 1-inch tubular webbing, tie it into a loop using the water knot. The finished loop should be about 14 inches long. This sling will be utilized in snow belays.

**Chest Harness:** Using the 9-ft piece of one-inch tubular nylon webbing, tie the ends together using a water knot. but do not cut the webbing until you are absolutely sure it is the right length Depending on your size, you may need as little as 6 ft. or as much as 9 ft. The length should allow for adjustments in clothing, such as for a cold night wearing layers on a crevasse or in a t-shirt on a warm sunny day.

**Pack Sling:** You will use perlon or 1-inch webbing for the pack sling. Take 8 feet of perlon, tying it into a loop using a double fisherman’s knot, or, one inch tubular webbing, tying it into a loop with a water knot. Use a girth hitch to attach it to your pack.

**Tying The Texas Prusik:** The Texas Prusik consists of two prusik slings, the foot sling and the harness (or seat) sling. Both prusiks can be made from a 25 foot length of perlon, which will be long enough for anyone under seven feet tall.Use the instructions on page 395 of *The Freedom of the Hills* 9th edition as a guide.

**Tips:**

* Make sure you measure the leg loops against each other. You want them to be identical lengths.
* Leave excess tail on your Texas Prusiks in case you need to later adjust the length.

## KNOTS STATION

Knot-tying is an inherent part of climbing, and your safety depends on knowing how to tie knots correctly. At this station you will practice correctly dressing and tying knots, as well as memorizing their uses.

* Single Bowline (Bowline) (practice this around a post or a table leg)
* Water knot
* Figure 8 loop (Figure 8 on a bight)
* Rewoven Figure 8 (Watered Figure-8 or Prussian Bend)
* Double Fisherman’s knot (Double Fisherman’s bend; Grapevine knot)
* Prusik knot
* Girth hitch
* Alpine Butterfly
* Bowline on a Coil
* Bachmann Knot
* Münter Hitch
* Clove Hitch.
* Mule Knot
* Flat Overhand Bend

**Dressing Knots**

This term refers to the practice of ensuring that the rope or webbing used to tie a knot is correctly positioned so the knot material lies cleanly and in correct position in relation to the other strands in the knot. For some knots it is extremely importantfor the knot to be not only properly tied but correctly dressed. Examples are the prusik knot and the water knot. Final strength of all knots and cords/webbing with knots in it depends on how well the knots are dressed.

# FIELD TRIP #1 - FUNDAMENTALS

**Knots, Belays, Prusiking, Anchors, Leader Tie-off and Belay Escape**

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| --- | --- |
| **FIELD TRIP #1– FUNDAMENTALS & PRUSIK TEST** | |
| **Date/Time:** | Date: February 22nd or 23rd  Starting Time: Arrive by 7:30 am and be ready to go by 8:00 am.  Duration: Approximately 8:00 am to 5:00 pm |
| **Location:** | *Tacoma Mountaineer Clubhouse 2302 North 30th St, Tacoma* |
| **Purpose:** | * Practice Knots * Practice Prusiking – Self Crevasse Rescue * Practice Belaying (Munter and Device Belays) and climbing signals * Practice Leader Tie-off and Belay Escape * Understanding Anchors * Discuss the care of a climbing rope and practice rope coiling * 10 Essential systems checked |
| **Prerequisites:** | * Lecture #1 * Field Trip #1 Prep |
| **Assignments:** | * Read Basic Rock & Glacier Climbing Manual Field Trip 1 material * Review all Field Trip 1 Prep assignments |

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| **EQUIPMENT**  **See Required Equipment FT1 on the Equipment Matrix** |

**PROCEDURE**

When you walk in, start getting ready for the day by putting on your helmet, harness, and boots. Next the field trip leader will split you into groups and/or assign you to an instructor and send you to a station. While at the stations you will be practicing the skills listed above in the purpose section. Keep in mind, we don’t expect you to be an expert, but we do expect you to have done your reading so be prepared to be asked questions, and hopefully you come with some of your own. You will then rotate and complete all stations before the end of the day.

If you find that you have down time, practice knots or take the knots test. Help other students. Be useful and/or practice skills. Eat when you are hungry, drink when you are thirsty, but make sure you are not holding up a group by doing so.

NOTE: Some of the stations will be outside so make sure you have appropriate clothing. Take all your gear with you everywhere you go, so if it is raining and you don’t have a dry sack, line the inside of your pack with a large garbage bag so everything stays dry.

**10 ESSENTIAL SYSTEMS STATION**

We want to take a first look at what you carry for your 10 Essentials, and talk about things that you could/should use. Remember: These are your personal backup safety items. Have good ones, and replace bad ones as required. They will be “tested” at the beginning of Field Trip 3, and checked on EVERY field trip after that.

## 

## ROPE CARE AND COILING STATION

At this station, you will be shown how to properly butterfly coil a rope, and given a chance to practice. In addition, we will discuss proper rope maintenance and care.

**TEXAS PRUSIK STATION (Self Crevasse Rescue)**

Here you will get another chance to practice tying into a rope for glacier travel, prusiking, and safely dropping your pack. This time, however, try to come prepared, remembering how to tie into the rope and set up your prusiks.

### ROPING UP/ TYING IN FOR GLACIER TRAVEL

**EVERYONE: personal anchor should be girth hitched to the hard points of your harness and pack sling girth hitched to your pack.**

**End Climber:**

* Tie in: Use a Rewoven Figure-8 on the rope attached through the hard points of the seat harness. The lower (foot) prusik tied on next to the Figure-8 and the foot loops are tucked into the pockets to keep them out of the way. The upper (chest/seat harness) prusik is tied on above the foot prusik and clipped into a locking carabiner off of the belay loop of the seat harness.
* Picket set up: a single sling girth hitched to the **top hole** in the picket. Make sure your water knot is not at the end of the sling where you would clip a carabiner to set up your anchor. It is helpful to carry your picket with a locking carabiner already clipped to the sling.
* Additional items: Have a tie-off sling attached to its own non-locking carabiner, so you can quickly set up your Bachmann. Have your pulley attached to its own non-locking carabiner

**Middle:**

* Ties in: Use an Alpine Butterfly, secured to the harness using two opposite and opposed locking carabiners. Typically the seat/chest prusik is tied into the rope going to the leader and foot prusik is tied into the rope going to the end climber. The foot loops are tucked into pockets or clipped to the harness to keep them out of the way. The chest/seat prusik loop is clipped into the belay loop of the seat harness using a third locking carabiner.
* Picket set up: a double sling girth hitched to the **middle hole** of the picket. Make sure your water knot is not at the end of the sling where you would clip a carabiner to set up your anchor. It is helpful to carry your picket with a locking carabiner already clipped to the sling.
* Additional items: Have a tie-off sling and a pulley attached to a non-locking carabiner.

## ANCHOR SYSTEMS STATION

Here we are going to talk about anchors:

1. What it means to have a SERENE anchor, and how to recognize one.
2. Sport anchors (fixed) vs trad (removable) anchors vs natural anchors
3. To recognize the different parts of an anchor:
   1. Master Point vs. Shelf
   2. How/When to attach to an anchor using a PA vs Clove Hitch vs both
4. Tie and Size your personal anchor (PA)

## BELAYING AND CLIMBING SIGNALS STATION

Here we will teach you about the belay chain for lead climbing (flaking out the rope, tying in for climbing, attaching to the anchor, and setting up your belay device), and how to properly belay with a munter hitch and a device using the PBUS method of belay. We will also explain and have you practice the climbing signals. To prepare you for this station, take a look at how to correctly clip a carabiner, and see Field Trip 2 Belay Test Station for a more details step-by-step system set up.

**DOWN AND OUT: HOW TO CLIP CARABINERS INTO AN ANCHOR POINT**

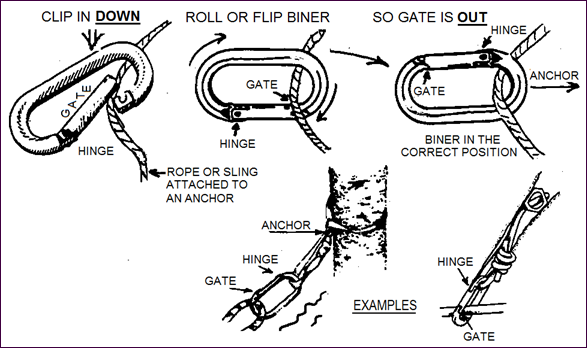
The term down-n-out serves as a mnemonic to help ensure carabiners are clipped correctly into an anchor.

Step 1: You should be holding the spine of the carabiner, with the gate opening across from the fingers and the gate hinge across from the palm,

Step 2: Using a top **DOWN** action (See the illustration), clip the carabiner onto the rope or sling of the anchor

Step 3: Once clipped in, roll or flip the carabiner over so the gate is **OUT**. Notice that the hinge end of the gate is toward the anchor.

**HOW TO TELL IF YOU CARABINER IS PROPERLY CLIPPED IN:**

* **THE GATE OPENING IS AWAY from the anchor:** This allows you to clip a second rope or slings into the carabiner with minimum chance of it becoming disconnected from the anchor. It also keeps the stress of a pull on the spine of the carabiner.
* **THE GATE IS OUT (OR UP):** When you look at a clipped-in carabiner the gate should be facing **out (or up)** from the rock face, the ground, etc. The gate has less of a chance of being opened by contact with the ground, and your rope from accidently becoming unclipped.

**LEAD CLIMBING BASIC BELAY SYSTEM SETUP (see figure 10-2 pg 173 in FOH 9th edition for diagram)**

1. Flake out the rope onto the ground next to what will become the braking hand side of the belay. Make sure you are less than an arm’s reach from the anchor.
2. Using the “bottom” end of the rope (the end that would be under all the rope after its flaked out) tie a rewoven Figure-8 knot directly to your seat harness, making sure it goes through both hard points.
3. Standing no longer than an arm’s length from the anchor clip a locking carabiner (down-n-out) into the anchor and clove hitch the rope coming from your seat harness to the locking carabiner. Adjust the rope length, if necessary, by adjusting the clove hitch so that the rope is taut to the anchor when you are in a comfortable belay stance.
4. Take rope coming from the (tied in) lead climber, and connect it to your seat harness through your belay device with a locking carabiner. Make sure the rope to the climber is coming out of the “top” of your belay device, and the braking strand is coming from the “bottom” edge. Lock the carabiner.
5. Check that your tie-off sling and any equipment that might be necessary is accessible to you.
6. Now you are ready to belay. Do a systems check with the lead climber to double check everything has been set up correctly. Assuming everything is good to go and you have your belay glove on, your climber is ready to climb, you call “BELAY ON”.

### IN SEARCH OF THE PERFECT BELAY

### *Excerpt from article* *by Craig Luebben [www.rockandice.com] –used by permission.*

“Ten years ago my partner and I planned to climb the East Buttress of Middle Cathedral rock, one of Yosemite Valley's most popular routes. As we approached the base, a very dazed and confused climber staggered toward us. He muttered that he had just landed in a tree after falling one hundred feet — while seconding a pitch! Miraculously, the climber appeared to be only shaken up. His belayer hadn't fared as well. He'd been using the good old hip belay — with no guide carabiner — and wasn't tethered tightly to his anchors. When the second slipped, the belayer was pulled off his belay ledge, the rope flipped over his head and, as his second zoomed down into the trees, the belayer desperately clutched the rope as it smoked through his hand, burning them to the bone. I'll never forget his sobs from the pain and emotional burden of nearly killing his buddy.”

Unfortunately, this scary story of bad belaying has seen too many modern remakes. The mechanics of belaying (a word derived from sailing terminology, meaning "to make fast or secure") are pretty simple; consequently, some climbers take the process lightly, and accidents occur as a result. Belaying is the most important responsibility climbers routinely face. As a belayer, you literally hold your partner's life in your hands. You must be proficient at handling the rope — and focused. I hope you never have to explain to your partner (assuming she's not dead — maybe she's just writhing in pain) that you only took your brake hand off of the rope for a half-second. Dropping your partner is really bad for your reputation. In addition, sad but true, another concern now exists: civil liability. Recently a court found a belayer who failed to stop his partner's fall liable for his partner's hospital bills.

The belayer's primary duty is to manage the rope and hold it securely if the climber falls. The intelligent belayer also wears a helmet, knowing that falling rock or gear could injure or kill him or her, and consequently kill the climber when the belayer lets go of the rope. — Ed.]

The primary rule of belaying is that the "brake" hand **NEVER** leaves the rope. The other hand — the "guide or feeling" hand — takes in or feeds out rope as it's needed by the climber. It holds the rope each time the belayer slides the brake hand along the rope to the next grip. If the climber falls or hangs, the brake hand must instantly bend the rope to the side. This forces the rope into a Z as it goes from the climber into the belay device, around the locking carabiner, out of the belay device, and to the brake hand. This creates enough friction to hold the rope. Practice belaying using both the left and right hands as the brake so you will be prepared to deal with any situation that may arise.

### PBUS METHOD OF BELAY

1. Hold brake hand palm down with your thumb toward the belay device and feeling hand palm up with your pinky toward the belay device. The feeling hand and brake hand work in unison to pull in rope,
2. At the end of the pull, the brake hand should go into the brake position and the feeling hand should move to the brake side of the rope below your brake hand. This serves temporarily as the back-up brake.
3. Slide your brake hand up the rope towards the belay device and return the feeling hand back to the climber’s side of the rope. Repeat the steps again.
4. **The brake hand does not leave the rope!!!**

Note: **Always wear gloves**. Do not use bare hands as illustrated below.

|  |  |  |
| --- | --- | --- |
| Palm Down 1 | Palm Down 2 | Palm Down 3 |
| **1)** | **(2)** | **(3)** |  |

**CLIMBING SIGNALS**:

Learn and use the following signals:

On belay Belay on Climbing

Climbing on Watch me Up Rope

Take Slack Falling

Rock!!!!

### LEADER TIE-OFF AND ESCAPING THE BELAY STATION

At this station we will walk you through Leader Tie-off and belay escape. As well as discuss the circumstance of when you would use both. We do this very slightly differently than is stated in FOH. [You can view an instructional video at this link](https://drive.google.com/file/d/1VKpRyC1s2bVknwFJ1jb62GyY02EY15iq/view). [You can view images of the steps at this link or below.](https://drive.google.com/file/d/1UOJV7PQyssvTMjBek2e1flIvjrTCsuDI/view)

# FIELD TRIP #2 – SKILLS TEST AND GLACIER TRAVEL PRACTICE

|  |  |
| --- | --- |
| **FIELD TRIP #2 – BELAY & PRUSIK TEST** | |
| **Date/Time:** | Date: March 21st or March 22nd  Starting Time: Arrive by 7:30 am and be ready to go by 8:00 am.  Duration: Approximately eight hours |
| **Location:** | *Tacoma Mountaineer Clubhouse 2302 North 30th St, Tacoma* |
| **Purpose:** | * Critical Skills Test: Belaying (Munter and Device – PBUS method) * Essential Skills Tests: Prusik and Leader Tie-off with Belay Escape * Practice and/or take knot test (must be passed by the end of FT3) * 10 Essential Systems checked * Practice roped glacier travel and snow belays * Practice the kiwi coil * Introduction to crevasse rescue systems: 3:1 (Z) pulley demo |
| **Prerequisites:** | * Lecture 1 & 2 * Field Trip #1 Prep & Field Trip 1 (or equivalent) |
| **Assignments:** | * Reading: *Freedom of the Hills, 9th edition* Glacier Travel and Crevasse Rescue… Chapter 18   Snow Travel and Climbing……………Chapter 16   * Study: Information contained in Field Trip 2   Information required for Lecture 2  Information and assignments for Field Trip 1 Prep and Field Trip 1 |

**Belay, Prusiking, and Leader Tie-off with Belay Escape Tests & Glacier Skills**

|  |
| --- |
| **EQUIPMENT**  **See Required Equipment FT2 on the Equipment Matrix (Lecture 1)** |

**PROCEDURE**

When you walk in, start getting ready for the day by putting on your helmet, harness, and boots. Next the field trip leader will split you into groups and/or assign you to your first station. At each skill testing station (prusik, belays, and leader tie-off with belay escape), you will be expected to correctly and proficiently preform each skill without help from the instructor. For the remainder of the stations you will start preparing for Field Trip 3 by practicing roped glacier travel skills, knots, and 10Es. At the end of the day, the instructors will demo the 3:1 (Z) pulley crevasse rescue system. If you can, take your Knots Test. It must be passed by the end of Field Trip 3.

**Rules**

1. Helmet and gloves REQUIRED at the belay, prusik, and leader-tie off w/escape stations.
2. Correct clothing and mountaineering boots are required for this field trip.
3. You should come prepared for the skill tests prior to showing up for the field trip, no help will be given by the instructors to pass the skills test.
4. You will fail (receive a NS grade at a testing station) if you do anything considered unsafe or need instruction.

**10 ESSENTIAL SYSTEMS STATION**

At this station, we will continue refining what you carry for your 10 Essentials, and talk about things that you could/should have. Your 10 Essential System will be “tested” at the beginning of Field Trip 3, and checked on EVERY field trip after that.

## KNOTS STATION

At this station you will continue to practice correctly tying and dressing knots, as well as memorizing their uses. If you feel ready, ask the instructor if you can take the knots test. It must be passed by the end of Field Trip 3.

**BELAY TEST STATION (Munter and Device)**

This is a test of your ability to perform the **Critical Skill** of belaying a fellow climber. You will be expected to perform two belays (a munter hitch and device, each using a different hand) with no coaching from the instructor.

Assumptions/Scenario: You are out on a Basic Rock climb. The leader has just finished building the anchor, and needs to finish getting their gear prepared to start the climb. They have asked you to set up the belay.

NOTE: You should already have your helmet on and your slings, carabiners, and gloves on you or very nearby.

Grading Criteria

1. System Setup and Stance:

* 1. Flake out the rope. Instructors are looking for you to have the rope flaked out on the same side as your braking hand.
  2. Correctly tie-in. Instructors are looking for a dressed rewoven figure 8 and overhand back up knot, attached to your seat harness through both hard points, using the “bottom” end of the stack of rope.
  3. Attach yourself to the anchor. Instructors are looking that you have clove hitched to the anchor with the rope, no more than an arm’s length away.
  4. Set up the belay. Instructors are checking that you have taken the rope coming from the climber, and attached it to your seat harness by either correctly threading it through your belay device with a locking carabiner attached to your belay loop or with a munter hitch on a locking carabiner to your belay loop (make sure to lock the carabiner).
  5. Do a safety check with climber. Instructors are looking for the following checks:
     1. Check that all harness buckles are double-backed (if applicable) and the harness is on correctly.
     2. Check that the figure 8’s are tied and dressed correctly and that you have a backup knot.
     3. Check that the rope is tied to both hard points of the harness.
     4. Check that the belay device/munter hitch is set up correctly and the carabiner is locked.
     5. Check that the anchor is SERENE (or as close to SERENE as possible) and all carabiners are locked.

1. Climbing Signals: Instructors want to hear you use the following signals and see that you take the proper actions of taking in or paying out rope.
   1. On belay
   2. Belay on
   3. Climbing
   4. Climbing on
   5. Watch me
   6. Take
   7. Slack
   8. Up rope
   9. Falling
2. Belay Technique. Instructors are looking for the proper hand movements of the PBUS method of belay while the leader is climbing, and that you never let go of the braking strand.
3. Braking Technique. Instructors will be watching to make sure you can safely catch an unsuspecting falling climber using the correct braking positions. Forward braking with the Munter hitch. Down/backward braking with the belay device.
4. Lowering Technique. Instructors will check that you can safely lower a climber; you are able to maintain control of the lower, and stop lowering when directed.

### LEADER TIE-OFF AND ESCAPING THE BELAY TEST STATION

This is a test of your ability to perform the Essential Skill of tying-off a lead climber and escaping the belay to go get help. You will be expected to perform this skill with no coaching from the instructor. You will only be required to tie-off the leader using your belay device and you can choose if you want to belay either right or left handed.

Assumption/Scenario: You are out on a Basic Rock climb. The leader has just finished building the anchor, and asked you to set up the belay (same as the belay test station). The leader starts to climb, and unsuspectingly falls. The rope is caught on something above so you cannot lower them, and the leader is too injured from the fall and cannot climb up. You need to tie them off and escape the belay to go get help.

NOTE: You should already have your helmet on and your slings, carabiners, and gloves on you or very nearby.

Grading Criteria

1. System Setup and Stance (same as belay test station)

2. Climbing Signals (same as belay test station)

3. Belay Technique (same as belay test station)

4. Braking Technique (same as belay test station)

5. Leader-Tie Off

**SEE LINK TO VIDEO, POWERPOINT, AND PHOTOS OF THE SEQUENCES IN THE FIELD TRIP 1 SECTION OF THE MANUAL.**

**SELF CREVASSE RESCUE (TEXAS PRUSIK) TEST STATION**

This is a test of your ability to perform the Essential Skill of self-rescue from a crevasse. You will be expected to perform this skill with no coaching from the instructor.

Assumption/Scenario: A snow bridge collapsed, and you have fallen into a large crevasse. Luckily, you are uninjured from the fall, and able to maneuver in the crevasse. You think you can get out, the rope is not entrenched in the lip, but it is wet and starting to get icy. As you start to ascend you decide your pack is impeding your progress, so you decide to drop it and so you can get out of the crevasse more efficiently (because Brrrr its cold down there).

NOTE: You should already be wearing your helmet, chest harness, and back pack (with pack-sling set up). If you do not have these items on, do it when you arrive at the station.

Grading Criteria

1. Tying In/Attaching Prusiks

a. End of the rope tie-in: use a dressed rewoven figure 8 and overhand back up knot, attached to your seat harness through both hard points. Prusiks go above the overhand knot with the chest prusik above the foot prusik. The chest prusik should be attached to the belay loop of your seat harness with a locking carabiner.

b. Middle of the rope tie-in: use a butterfly knot. Attach the butterfly knot to the belay loop of your seat harness with two locking carabiners opposite and opposed. Your prusiks should be attached to either side of the butterfly knot. Your chest prusik is placed on the same side of the butterfly knot as the lead climber. Then attached to the belay loop of your seat harness with a third locking carabiner. The foot prusik is attached to the opposite side of the butterfly knot (going to the following climber).

Grading: Instructors will check that you have correctly tied-in, attached your prusiks, and locked your carabiners.

2. Ascending/Descending

Suspended in the air, you will be expected to don your foot prusiks and connect your chest prusik to your chest harness. Once this is complete, you will start ascending the rope until you have enough slack to softly drop your pack. Continue ascending the rope until you reach the rafters, then descend to the ground.

Grading: Instructors will be watching to make sure you SOFTLY drop your pack.

3. Physical Conditioning

You risk hypothermia and your team’s well-being, if you cannot quickly get out of the crevasse.

Grading: You have 20 minutes to ascend the rope and touch the rafters.

### GLACIER TRAVEL SKILLS STATION

With Field Trip 3 quickly approaching, we need to start introducing and practicing glacier travel skills.

### ROPING UP AND GEAR SET UP FOR GLACIER TRAVEL

**EVERYONE: personal anchor should be girth hitched to the hard points of your harness and pack sling girth hitched to your pack.**

**End Climber:**

* Tie in: Use a Rewoven Figure-8 on the rope attached through the hard points of the seat harness. The lower (foot) prusik tied on next to the Figure-8 and the foot loops are tucked into the pockets to keep them out of the way. The upper (chest/seat harness) prusik is tied on above the foot prusik and clipped into a locking carabiner off of the belay loop of the seat harness.
* Picket set up: a single sling girth hitched to the **top hole** in the picket. Make sure your water knot is not at the end of the sling where you would clip a carabiner to set up your anchor. It is helpful to carry your picket with a locking carabiner already clipped to the sling.
* Additional items: Have a tie-off sling attached to its own non-locking carabiner, so you can quickly set up your Bachmann. Have your pulley attached to its own non-locking carabiner

**Middle:**

* Ties in: Use an Alpine Butterfly, secured to the harness using two opposite and opposed locking carabiners. Typically the seat/chest prusik is tied into the rope going to the leader and foot prusik is tied into the rope going to the end climber. The foot loops are tucked into pockets or clipped to the harness to keep them out of the way. The chest/seat prusik loop is clipped into the belay loop of the seat harness using a third locking carabiner.
* Picket set up: a double sling girth hitched to the **middle hole** of the picket. Make sure your water knot is not at the end of the sling where you would clip a carabiner to set up your anchor. It is helpful to carry your picket with a locking carabiner already clipped to the sling.
* Additional items: Have a tie-off sling and a pulley attached to a non-locking carabiner.

**THE KIWI COIL** The "Kiwi Coil" is commonly used for glacier travel when the rope needs to be shortened, resulting in closer spacing between climbing partners. Typically only the end climbers will coil and carry the extra rope. NOTE: your prusiks are placed on the rope after the coil is finished.

Step 1: Tie into the end of the rope with a rewoven figure 8 through both hard points of the harness, back up the figure 8 with an overhand knot.

Step 2: Start coiling the rope over your neck and around your hand with your palm facing down as seen in figure 1 (your palm should be at or very near your belay loop, the pictures have the coils too short, which can pull on you neck in the event of arresting a fall). Continue coiling up the rope until you have taken in the desired amount. Typically 8-12 coils, but it depends entirely on the specific situation.

Step 3: Take the coils, keeping them around your neck, but putting your arm through the center so that they are now over the shoulder opposite the hand you used to coil around. The free end of the rope should come down from behind the shoulder the coils were placed over (figure 2).

Step 4: Take free rope end into your hand (figure 2) and begin to “tie off.” Make a bight in the free end and pass it through your belay loop (figure 3). Pull the bight through the belay loop with your other hand (figure 4). Pull out roughly 18" to 24" (figure 5). 

Step 5: Now reach under the coils at your chest and grab the bight with the hand that the coils cover the shoulder (figure 5). Now, draw the bight back through the chest coils to the other side (figure 6). 

Step 6: Take the bight and wrap it under the rope leading to your partner (figure 7). Continue wrapping it around this strand (figure 8) and then make an over hand knot with the bight upon itself (figure 9). It is important that the knot is finished with the end leading away from you.

Step 7: Finally, clip this end of the bight back into a locking carabiner onto the belay loop your harness. Now put your prusiks on the rope, and then you are ready to go.

**BELAYING TEAM MEMBERS IN AND OUT ON A GLACIER**

The purpose of belaying your rope team members into or out of rest stops and camps on a glacier, is to never allow a significant amount of slack in the rope between yourself and your rope team members. Less slack lowers the momentum that can be gained by a falling climber. The two main methods for quick and less formal belays taught in the Tacoma Basic Climbing Course are the Seat Harness Prusik Belay and Carabiner-Ice Axe Belay.

**Seat Harness Prusik Belay:** The Seat Harness Prusik belay is a simple and the fast method of establishing an anchor for belay out of rest areas and camp, where a bomb-proof anchor is not needed and slip is less likely.

NOTE: The leader will probe the immediate area for hidden crevasses when stopping on snow slopes of a glacier.

Step 1. Pull 3-5 feet of rope from your harness (moving your chest prusik along the rope).

Step 2. Tie a clove hitch, and slide it up the shaft of the ice axe to the base of the head. Then plunge the axe into the snow, with the head of the axe perpendicular to the direction of fall.

Step 3. Place your uphill foot on the head of ice axe (make sure not to step on the rope), and set up a sturdy belay stance.

Step 4. Use your seat harness/chest prusik to take up rope, belaying your team member in by pulling the climbing rope through the prusik knot. The next climber in on the rope team would repeat the same procedure.

Note**:** A climber positioned in the middle of a rope team will belay in a follower using their foot prusik – for this application the prusik foot loops must be attached to the belayer’s belay loop with a locking carabiner.

The same system can be used when departing camp, paying out the rope between climbers through the prusik knot. The last climber out of camp should however have the system ready to set up (the chest prusik should be close to the second climber), but remain ready to arrest in the chance that the lead climber falls.

**Carabiner-Ice Axe Belay**: The Carabiner-Ice Axe belay should be used to provide a [top belay](https://www.neilhopkins.us/mountaineering-guide-2/safety.html) to a weak or tired climber whom is ascending or descending a slope and a slip may be more likely. Note: this is not a bomb-proof anchor which would be required if a fall (not slip) is more likely. Please refer to *Freedom of the Hill*s, Belaying on Snow (Pages 357-359) for set up and stance.

# 

### 2:1 (C) Pulley and 3:1 (Z) PULLEY CREVASSE RESCUE SYSTEM DEMO STATION

You will be introduced to the 2:1 (C) 3:1 (Z) pulley crevasse rescue system. Instructors will demonstrate the proper set-up and perform a simulated rescue.

# FIELD TRIP #3 – WINTER OVERNIGHT

**Snow Camping, Ice Axe Techniques, Snow & Roped Glacier Travel**

|  |  |
| --- | --- |
| **FIELD TRIP #3 – SNOW CAMPING** | |
| **Date/Time:** | Date: March 28th – 29th  Starting time: Arrive by 7:30 am and find your instructor |
| **Location:** | *Mt. Rainier National Park, Longmire Parking Lot* |
| **Directions:** | Go East on SR 512 to SR 7. South on SR 7 to SR 706 in Elbe. East on SR 706 through Ashford to the Nisqually Entrance. Pay entrance fee and continue to Longmire. |
| **Prerequisites:** | * Lecture #1, 2, & 3 * Field Trip #1 Prep, FT #1 * Complete a qualifying Conditioner |
| **Assignments:** | * Reading: *Freedom of the Hills, 9th edition*   Camping and Food ……………………............Ch 3  Leave No Trace ……………………………….Ch 7  The Cycles of Snow…………………………...Ch 27  Mountain Weather …………….........................Ch 28  Snow Travel and Climbing …………................Ch 16  Avalanche Safety................................................Ch 17  Glacier Travel and Crevasse Rescue…………..Ch 18   * Study: Information contained in this section. * Review/Practice Ice axe arrest techniques and Crevasse Rescue 3:1 (Z) Pulley |
| **Purpose:** | * Evaluate 10 essential systems * Knots Test * Practice snow travel skills * Practice roped glacier travel * Practice and demonstrate ice-axe arrest proficiency * Practice snow anchor construction * Practice emergency snow shelter construction * Practice setting up an expedition snow camp * Practice route finding on snow * Practice roped team arrests * Practice carabiner-ice axe belay * Practice crampon techniques * Discuss camp skills/techniques and nutrition * Practice 3:1 (Z)-pulley crevasse rescue system * Kiwi Coil |
| **Additional Resources** | **Weather Forecasts:**  Mountain Weather Forecast Resource - [**http://www.mountain-forecast.com/**](http://www.mountain-forecast.com/)  NOAA Mountain Weather Forecast [**http://www.wrh.noaa.gov/sew/forecast03.php**](http://www.wrh.noaa.gov/sew/forecast03.php) |

|  |  |
| --- | --- |
| **EQUIPMENT**  **See Required Equipment FT 3 on the Equipment Matrix (Lecture 1)** | |
| **Special Notes & Items** | * **Map: USGS map “Mt Rainier East” / CALTOPO Print out/GPS tracks** * **Drivers need a current *National Park Pass* or pay *National Park entrance fee*** * **Mountaineering boots and adequate clothing (no cotton) required.** * **Ice axe adze must be covered with duct tape** * **Must have the 10 Essentials, blue bags, and snow stakes for your tent** * **All food must be stored in bear canisters. Do not leave ANY left in the tent.** * **Carpool, as much as possible. Chains are likely required for vehicles.** |

**PROCEDURE**

When you arrive at Mount Rainier National Park, drive to Longmire and meet the instructors at the picnic tables near the entrance to the Longmire Inn, no later than 7:30AM (if you are going to have to use the restroom, arrive early). Find your instructors, they are going to need to check that you have a complete set of 10 Essentials, all required gear, and adequate clothing or you will not be allowed to participate in the field trip. Once your 10Es, equipment and gear have been checked, repack your bag, and get ready to head up to Paradise. You should repack and be ready so that when you get to the Paradise overnight parking lot, you can be ready to start hiking to camp in 15 minutes. Also make sure you and your team have a rope and a bear canister. The ropes and bear cans will be provided by the instructors.

The Longmire gate opens at 9am and the group will drive up to the Paradise overnight parking lot. Make sure the field trip leader has your license plate information, and that you park on the overnight side of the lot (far side). Around 9:45 AM the group will depart the overnight lot and start heading to the Deadhorse group camping area. Your team/instructors will be assigned a team camping area within the group camp site, the team will need to navigate to that area, select a camp site, and move to your first station.

On Saturday, the field trip will cover snow/expedition camp set up, camp skills/techniques/nutrition, crevasse rescue practice, and ice axe arrest practice. At the end of the day, you will need to go back to your camp, start melting water for dinner (and the next day), and get set up to practice glacier travel EARLY Sunday morning.

On Sunday, you will get an alpine start to practice a simulated glacier climb. During this time you will practice roped glacier travel and crampon techniques. Around 7 AM you start the stations of the day, practicing emergency snow shelters, snow anchors and belays, crevasse rescue, and test individual ice axe arrests and team arrests. It is recommended to have a quick breakfast, have crampons ready, rope set up and ready to tie in before you go to bed Saturday night.

Around 3pm on Sunday, you will return to camp, quickly break it down (remember your leave no trace principles), and hike out to the Paradise Parking lot. Everyone needs to work together to break down the campsite on Sunday. The Longmire gate closes at 5 PM so we need to be down to Longmire before then.

NOTE: ALL GARBAGE MUST LEAVE WITH YOU. PICK IT UP AND PACK IT OUT (do not leave it in the bear cans). REMEMBER TO DESTROY YOUR TENT PLATFORM AND KITCHEN. DON’T FORGET YOUR BLUE BAGS.

**TIPS FOR A BETTER WINTER OVERNIGHT FIELD TRIP EXPERIENCE:**

* **Look over the skills you learned in field trip 2**
  + Roping up for glacier travel
  + Know how your gear should be set up for each rope position on a glacier climb
  + Belaying in and out of camp
  + Carabiner ice axe belay
  + Crevasse rescue
* **Duct tape the adze of your axe with many (at least 5-6) layers. Tape the pick too if you are nervous or concerned.**
* Bring multiple pairs of gloves/mittens. Have a pair that you use to keep your hands warm while walking, and pair or two (if you do not have a layering system) that will get wet while digging anchors, emergency shelters, and during ice axe arrest. It is advised to have a glove/mitten layering system, and to bring more than one base layer.
* Bring extra clothes to change into back at camp Saturday night and that you can wear Sunday. Have dry clothes to change into after the field trip is over at the car too, it will make the ride home more pleasurable.
* Be ready for cold and wet. **NO COTTON!!! Bring hand/foot warmers, extra socks, a extra base, mid, and a shell layers.**
* Line your pack with a garbage bag to keep contents from getting wet.
* Check the weather and pack clothing accordingly
* Bring some “11s”: recommendations: earplugs, toilet paper, hand/foot warmers.
* Bring a plastic bag so you can put your boots and water in the bottom of your sleeping bag at night to keep them warm.
* Put your partially wet clothes in the bottom of your sleeping bag at night. It will help dry them out incase you need them the next day. Do not put very wet clothes in your sleeping bag, they will not dry and will only make you cold.
* Bring a Nalgene or 2 and put hot water in them and store them in your sleeping bag, they will help keep you warm, keep your boots warm, and help dry out any clothes.

## SNOW CAMPING/ EXPEDITION CAMP SET UP STATION

At this station, your team will get the chance to set up camp, expedition style. You will need to continue to stomp out a platform for the students’ tents, set up the tents, dig out the vestibules, determine where your kitchen and latrine should be, build snow walls, etc. Make sure to bring snow stakes for your tent! It is required for each tent to have one shovel, but more than one is nice.

## TEAM (Z & C PULLEY) CREVASSE RESCUE STATION

# At this station you will get hands on practice building the 3:1 (Z) pulley and 2:1 (C) pulley team crevasse rescue systems. Each member of the team will get to practice being the lead and middle climbers during rescue. It is advantageous to start looking at and memorizing the steps and the Z-Pulley diagrams. You may also want to bring a foam sleeping pad for the middle climber to lie on while the leader starts the rescue.

## ICE AXE ARREST STATION

On Saturday, at this station, you will get a chance to practice ice axe arrest. On Sunday you will need to show proficiency arresting in soft snow in the following positions. If proficiency is not acquired you cannot go on Basic Alpine climbs until this skills is checked of (likely in FT 6).

* Feet first, with back on the snow, both with and without a pack
* Head first, with back on the snow, both with and without a pack
* Head first, with stomach on the snow, both with and without a pack
* Feet first, with stomach on the snow, no ice axe, no pack

## SNOW ANCHOR AND BELAYS STATION

At this station, you will get a chance to practice building snow anchors and belaying a fellow climber. You will also discuss snow pack and when each anchor should be used. You will need to correctly build the following anchors and practice belays:

* Bollard
* Pickets:
  + Vertical top clip
  + Sierra (vertical mid-clip)
  + Deadman (horizontal mid-clip)
* Practice Carabiner Ice Axe Belay
* Running belays

## EMERGENCY SHELTERS STATION

# At this station, you will have 30 minutes to build an emergency shelter. Start thinking what you might do if you are on a climb, weather starts to turn, and you are too far away to get to safety.

## GLACIER TRAVEL AND SNOW SKILLS

# As mentioned previously, we will simulate a glacier climb. You will be expected to get up and be tied into the rope at a designated time to start heading for the “summit”. You will be tested on your ability to be tied in with prusiks and crampons on, and ready to go at the designated time. Don’t be late. The instructors do like to get up to wait around for you to be ready. NOTE: if weather looks bad/cold, it might be a good idea to wear a base layer, most teams will not be moving very quickly.

# During your travel to the summit you will be able to practice many rope team skills:

# Belaying into and out of camp/rest areas \* Rope management/switch-backing/team communication

# Passing a picket \* Practice using wands

* Kiwi Coil \* Team Arrest

You will also get the chance to practice Crampon Techniques:

* American (combination)
* French (Flat-footing)
* German (Front pointing)

And Ascending/Descending Techniques

* Rest Step \* Traveling in Balance
* Kicking Steps \* Backing down
* Self-belay \* Plunge Step
* Glissading

# FIELD TRIP #4 PREP & ROCK LECTURE

**Intro to Rock Climbing & Rappelling**

|  |  |
| --- | --- |
| **FIELD TRIP #4 PREP – ROCK 1** | |
| **Date/Time:** | Date: April 8th or 9th  Starting Time: Be ready to go by 6:30 pm.  Duration: Approximately 3 hours |
| **Location:** | *Tacoma Mountaineer Clubhouse 2302 North 30th St, Tacoma* |
| **Purpose:** | * Take the knots test (if not complete) * Practice rock climbing techniques * Practice belaying skills * Demo/practice lead belaying skills * Practice Extended Rappel set up * Practice Carabiner Brake Rappel set up * Discuss SERENE anchor systems |
| **Prerequisites:** | * Lecture #1, #2 * Field Trip #1 Prep, #1 & #2 |
| **Assignments:** | * Reading: F*reedom of the Hills* 9th   Basic Safety Systems……………………...............Ch 9  Belaying …………………………..………............Ch 10  Rappelling…………… ……………………...........Ch 11  Alpine Rock Climbing ……………………............Ch 12   * Study: Information contained in this section.   Information required for Field Trip # 1 and # 2 |

|  |
| --- |
| **EQUIPMENT**  **See Required Equipment FT 4P on the Equipment Matrix (Lecture 1)** |

## ROCK I FIELD TRIP PREP

**PROCEDURE**

When you arrive at the clubhouse, put on your harness and gear, and start preparing yourself to learn and climb. You are going get the chance to get on the walls, practice different climbing techniques and belays. We will also start showing you how to set up different rappels, how to remove (clean) rock protection, and go over anchors.

**ROCK CLIMBING**

We will have set up different routes on the walls so you can practice different rock climbing techniques and top rope belaying.

**RAPPELS**

We will show you how to set up the extended and carabiner brake rappel methods.

**LEAD BELAY DEMO**

Here we will show you how to belay a lead climber, and if time permits we will let you practice.

**ANCHORS**

Here we will cover different SERENE anchor set ups.

## ROCK CLIMBING LECTURE

Excerpted with permission from **Accidents in North American Mountaineering 2002** published by The American Alpine Club, Golden, CO; Editorial, pg 2 Jed Williamson.

“Patterns to notice this year include the number of falls made more severe by inadequate protection…….……Another common cause for falls being more severe is an inadequate belay, usually due to a poor anchoring system or improper technique. A third category to look at when reading the (accident) narratives is the number of handholds and footholds that ‘broke off’ resulting in considerable falls. These examples provide a good reminder for one of the first lessons learned as a climber: Test all holds on any rock that has cracks or evidence of loose rocks --- no matter what the size.”

**LEARNING TO ROCK CLIMB**

***From Basic Rock Craft by Royal Robbins (with permission)***

To become a good climber, you do not need great physical strength or superior coordination. These help, but far more important are interest and will supported by lots of energy. Nor is learning-rate a reliable indication of one’s future prospects. I have seen natural climbers who were extremely apt and learned quickly, only to reach a learning plateau and cease to improve; while others who at first were downright clumsy have, through dedication, become outstanding ... (rock climbers) ....

**Practice Climbing:**

The best way to sample climbing and learn the rudiments is to go with an organization or friends to a practice area or gym. You can learn much on small rocks and in the gym. Even experts may spend an entire day practicing on a 20-foot boulder. Study the information provided on knots, belaying and climbing. Belaying means protecting your partner with the rope, and doing it right means the difference between the rope being an agent of salvation for a falling climber and one of destruction for the entire party. So before attempting the actual climbing techniques, be sure you know how to tie yourself to the rope and that your belayer can protect you. Before starting, test the belay by yelling “Test” and slowly applying body weight. If satisfactory, test further by climbing up a couple of feet and jumping off. Obviously, the landing must be safe, and one must be prepared for the belay to fail. If the belayer still holds you with no trouble, his position is apparently sound and you may climb without danger.

Having taken these precautions, climb up using the techniques you have learned. If it gets difficult, don’t give up. You will never know how much you can do until you extend yourself to your limit, and you don’t know that until you fall trying. That’s the key word. Most people fall off a practice climb only after they have given up, and they never approach their real limits. Give it all you’ve got! You are now in the thick of the game. For novices to so push themselves, even when perfectly safeguarded, is usually difficult. If it goes too much against your nature, perhaps climbing isn’t your game. Self-confrontation and inner conflict, though only part of the sport, are nevertheless an inevitable part.

If the pitch is too hard, and you fall and are lowered, don’t despair; now you have a concrete goal. You have an idea of why you failed, whether it be strength, agility, technique, etc., and can work to improve that aspect of your climbing so you can return and solve the problem.

**Learn From The Leader:**

Watch the leader. Observe how they manage difficulties, their upright, relaxed body position, and their rhythmic movements. Note how, from a comfortable stance, they analyze the problems ahead and moves up smoothly and without hesitation to the next resting place.

By watching a person who knows what they are about, you can learn much. But remember that every leader has subtle bits of knowledge which you can never possess through mere observation. It is dangerous to jump to the conclusion that you are capable of leading what you can follow. It takes time to develop the judgment and self-control needed to safely lead difficult routes.

**GENERAL ROCK CLIMB KNOWLEDGE**

**Terminology:**

There are a lot of different terms and names used in rock climbing. Most apply to various techniques and equipment items. The belay terminology you have already learned and the knots are standard in all climbing situations where they are used. Some of the rock climbing terms that will be most useful to you at this point are listed below:

**A Pitch:** A pitch is generally considered to be a distance of one rope length (max) in a climbing situation. So if you start at a belay spot and climb up to the next belay spot, that’s a pitch. In some situations, the belay spots are separated by substantially less than a rope length, this is called a short pitch. A pitch where the belay spots are a full rope length apart is called a full pitch. The use of “short” and “full” to describe pitches has no formal basis other than just general usage. For general information, a climbing rope is now generally 200 feet, or 60 meters, and this is the most common accepted basis for the pitch. There are some climbing ropes of 165 feet or 50 meters. So, you can see a 165-foot rope used on a full 200 foot pitch could pose a significant problem.

**“Rock!!” “Rock!!”:** Loud and often is a warning to climbers of falling rock. If you hear this duck for any possible cover while yelling the warning to climbers below you.

**Helmet:** Never go on a rock climb without one!!! **Required** on ALL Basic climbs.

**Rope Team:** In rock climbing a rope team is normally composed of two people. One climbs while the other belays. Sometimes, it is a three man team, leader, first climbing student, who drags a rope up with him for the second student to climb on.

**Lead Climber/Leader:** The lead climber leads the pitch and places protection as he/she climbs. So if the leader falls the protection will minimize the fall distance.

**Second/Follower:** The person who belayed the leader will follow or second the pitch while on belay from above by the leader.

**Protection (Pro):** This includes all kinds of devices, such as hexes, cams, stoppers, and nuts that are placed in/on the rock to protect the leader in the event of a fall. You can read up on this in *Freedom of the Hills*.

**Cleaning The Pitch:** As the second climbs the pitch he/she will remove the protection set by the leader while en route up the pitch.

**Chock Pick:** A small device used as an aid in cleaning the pitch to help extract nuts, stoppers, hexes that are stuck in cracks and crevasses in the rock.

**Communication**

Good communication between partners is essential to safe climbing. Sometimes regular partners have their own abbreviated commands, but in general it's best to use the formal signals listed here so there is no misunderstanding. If you're in a crowded climbing area, it's good to follow each command with your partner's name so she knows who's talking and to whom she should be listening. Twice, I have mistakenly been taken off belay after my partner heard another leader cry, "Off belay!" You can imagine my alarm when, in the middle of a crux, I heard my partner yell, "Belay off!" When the wind or river noise is excessive, even the loudest verbal communication may be impossible, so you should have already agreed upon an alternate system (a loud whistle is nice for this).

**Time Management:**

You will do a lot of waiting around on rock climbs. The second rope team cannot start the pitch until the first team clears the belay spot, and so on for the third rope team, etc. On basic rock climbs, the actual climbing once a rope team is set up does not take all that much time. Most of the time is spent setting up and breaking down belays, and getting ready. So if the first rope team wastes 10-15 minutes that delays the second and third rope team. If the second and third team waste a like amount of time, it does not take much to waste a lot of hours by wasting a few minutes here and a few minutes there. These wasted hours are important hours because they are day light hours on the mountain. The idea is to do the climb and get back down before it gets dark. So, it is very important when it is time for you to set up or break down your belay; get ready to climb, etc., be ready, and don’t waste time. This can cost a climb, or mean an unplanned overnight on the mountain (called a bivy), or a long hike out with head lamps.

In summary, sometimes delays and slow going are necessary for reasons of safety or other circumstances that are unavoidable. If it’s a good day and everything is going your way don’t end up stumbling down the trail by head lamp late at night tired and foot sore thinking “if I had not wasted so much time on tying knots, setting up and breaking down belays, I’d be eating pizza right now; or home with my boots off having some well-deserved refreshment.”

**Loose Rocks:**

Loose rocks are a great hazard on rock climbs. Take great care and make every effort not to dislodge rocks. This is something you must be conscious of all the time. If you do dislodge a rock yell **“ROCK, ROCK, ROCK”** as a warning to those below you on the mountain, whether you see them or not.

**TYPES OF BELAYS**

**Top-Rope Belay**

With a "slingshot" top-rope, the rope runs from your belay device up to the anchors at the top of the pitch and back down to the climber’s tie-in knot. The climber will attempt to climb to the anchors at the top of the pitch, while the belayer takes in rope (using the PBUS method) as the climber ascends and feeds it out as they descend. If the climber falls with the rope directly overhead, he/she shouldn't swing, hit anything, or fall far (at most 6-12 inches due to rope stretch).

**Leader Belays**

When belaying a leader, the belayer feeds rope out as the leader climbs up, and takes rope in if she moves back down or asks you to “take.” The exception occurs when the leader has clipped protection above her harness, in which case the reverse is true. As long as she stays below a clipped piece of protection, her situation is similar to being on top rope. Because the leader must ultimately climb above his/her protection, thus sacrificing this top-rope-like safety, being on the "sharp end" of the rope is usually much more risky than top roping or being the second.

After each piece of protection is clipped, allow a minimal amount of slack, allowing the leader to move freely, but not so much that you unnecessarily increase the potential length of a fall. Remember, for every foot of slack, there is another foot of potential fall. On the other hand, it is also important that the rope not impede upward mobility or, worse, pull the leader off.

To feed rope out, the brake hand pulls it toward the belay device as the guide hand pulls it out from the climber's side of the belay device. When the leader is about to clip protection, the belayer must feed rope out quickly, so the leader can easily pull up the necessary slack and quickly clip it into the carabiner. To feed rope rapidly, slide your brake hand along the rope until it is a full arm's length away from the belay device (never release your brake hand!) and slide your guide hand in next to the belay device, so that as soon as you see the leader reach down to pull up slack, you can pull out an arm's length of rope. Then return your hands to the starting position. If the leader grabs for more rope, quickly repeat the process.

Ideally, the leader shouldn't feel any resistance from the rope while climbing or clipping, but it can be hard to feed the rope fast enough. If the clip is super-desperate, you may need to feed slack just before the leader needs it, so she can pull rope freely; be prepared to pull the rope back in if she drops it — or suddenly falls — because a fall with extra rope out means an extra-long fall. If your partner falls or requires support from the rope, quickly bend the rope to the side from the belay device to brake the fall. Be especially attentive for a sudden fall when the leader has clipped protection but is still near the ground. If necessary, sit back into the rope to take up any slack

**WHAT TO EXPECT ON A ROCK CLIMB**

As a student taking this class it is likely you have never been on an alpine rock climb. The intent here is to explain something about what you can expect on your first rock climb. This will be where you will use a collection of skills you have learned and practiced on several field trips: knots, belaying, rappelling, and rock climbing techniques.

**Pre-Climb:**

After you sign up for your rock climb, a week or two before the climb, the climb leader will likely start a pre-climb email or schedule a meeting, The leader will cover the specifics of the trip, what the route will be, what equipment you are expected to bring, the climb schedule, and possible weather considerations if any. For the most part rock climbs are one day affairs from the trail head; at times, it’s a long day depending on the peak and how the climb goes. If the peak is some distance from Tacoma, you may travel to the trailhead area the day before and camp overnight in order to get an early start. If the rock climb is to be an overnight, there will of course be a discussion of who will bring what gear. You are expected to have done some preparation prior to the pre-climb and read some of the available information on routes and approaches. Often these logistics will be handled through email as well. If you have questions, ask them. There are no dumb questions. Be honest with the climb leader about your experience level. Always be prepared.

When the pre-climb is over you should know the following general information:

* Climb route and pertinent details.
* Scheduled meeting time and specific location at the trailhead.
* Carpool meeting times and location.
* Required equipment for the climb.

**The Trailhead:**

Be on time and be ready. The climb leader will check everybody out and give last minute instructions. You will be carrying a rope, so if you show up with 65 pounds of 10 essential systems in your day pack, you will end up with all that plus a 10-pound rope. So plan your equipment/food/clothing intelligently because you will carry it.

**The Approach:**

Don’t let the term rock climb create any false impressions. The approach hike into an alpine rock climb will include some distance on trails, some scrambling off trail, and sometimes crossing or climbing snow fields. Depending on current conditions the leader may tell you to bring crampons, snow shoes, and ice axe. Always expect to take your HELMET and wear good boots. Rocky trails, scree/talus slopes and scrambling third class rocks and boulders require rugged foot wear to protect your feet. The approach ends when you reach the base of the first pitch.

**The Climb:**

You will be assigned to a rope leader, you and the rope leader are a rope team. The rope leader will most often use rock shoes. However, it is at the discretion of the climb leader if you will be required to use mountaineering boot, or have the option to use rock shoes. Let’s assume you and your rope leader are going to be the first ones to climb. So what happens now? For one thing your fellow basic student classmates will be more than happy to sit back and let you sweat it out. The other thing is your rope leader will be watching you very closely; hoping dearly that you know what you’re doing well enough to inspire confidence on his part in your ability. The leader has a lot depending on you, and he/she wants to feel confident that you can do your job as the belayer while he/she is climbing. Activities at this point are fun but DEADLY SERIOUS BUSINESS. The leader and rope leaders will be watching you and everyone else looking for the following: Do you know your knots and how to tie-in to your harness? Can you set-up a belay correctly and quickly?

You are not expected to be a polished rock climber and know everything. You will get help where you need it; but you are expected to know your knots, how to set-up a belay once an anchor is established, and to belay well.

**Climbing the Pitch:**

Once you set up your belay and have told your climber “belay on,” he/she will start climbing after an exchange of signals (climbing/climb on). The leader will set protection as he/she climbs. After the leader reaches the top of the pitch and has established a SERENE anchor, he/she will call down “off belay.” This is your signal take the leader off belay and respond to the leader “belay is off”, and to pick up your gear and get ready to climb, while still being anchored in. The leader will start to pull up all slack in the rope, when they reach you, call up to the leader saying “that’s me.” The leader will then set up the belay, and when he/she calls out “belay on” you can unclip and break down the anchor. Before you start climbing, signal to the leader you are ready to climb by calling “climbing.” If the leader is ready you will hear them respond back with “Climb On.”

As you climb you will clean the pitch by removing the protection placed by your lead climber. You will need a chock pick for this chore, so have your own, or borrow one from your rope leader. When cleaning piece from the wall clip it to your harness or a gear sling over your shoulder, and THEN detach it from the rope. The purpose of this is to prevent dropping the piece, which can be expensive. It also is a safety issue, avoiding falling objects from hitting someone below. After you reach the top of the pitch, and clove hitch into the anchor, you’re off belay and can return the “pro” to the lead climber. Again, you set up the belay (flaking out the rope) so the lead climber can start the next pitch.

**The Summit:**

If your party moved right along you may have time to lounge around and have lunch on the summit, take pictures, and enjoy yourself. The leader will let the party know how much time can be spent.

**Getting Down:**

Remember the climb is only half over, don’t get careless. Every bit as much care and caution is needed on the trip down as was exercised on the way up. You will get to do a rappel. Once everyone is off the climb, gear is packed up for the hike out to the trailhead, surprise, you get to carry the rope again.

# FIELD TRIP #4 – ROCK 1

**Rock Climbing & Rappel Practice**

|  |  |
| --- | --- |
| **FIELD TRIP #4– ROCK 1** | |
| **Date/Time:** | Date: April 11th and 12th  Starting Time: Arrive by 7:30 am and be ready to go by 8:00 am.  Duration: Approximately eight hours |
| **Location:** | *Tacoma Mountaineer Clubhouse 2302 North 30th St, Tacoma* |
| **Purpose:** | * Practice rock climbing techniques * Practice lead belaying and catching a leader fall * Discuss and practice cleaning rock protection * Size autoblock (and personal anchor if not done already) * Practice/discuss scrambling in crampons * Discuss rappel anchors and set up * Practice carabiner brake rappel * Practice extended device rappel * Practice self-belay on rappel (leg wrap & autoblock) * Practice self-belay on 4th class rock – arm rappel and prusik on a hand line * Practice Fireman belays |
| **Prerequisites:** | * Lecture #1, #2, #3 * Field Trip #1 Prep, #1, #2, and FT #4 prep * Passed the Knots and Belay Test |
| **Assignments:** | * Reading: Review the readings assigned for Field Trip 4 Prep * Study: Information contained in this section.   Information required for Field Trip 4 Prep/Lecture  Information required for Field Trip # 1 and # 2 |

|  |
| --- |
| **EQUIPMENT**  **See Required Equipment FT 4 on the Equipment Matrix (Lecture 1)** |

**PROCEDURE**

As soon as you arrive, start getting ready by putting on your harness and gear. The field trip leader will soon provide instructions on the day’s activities and hand out field trip books. You will likely need a partner and be sent to one of the instruction stations.

You are responsible for your own progress through the practice stations. As you complete stations move on to the next one making sure to take your pack and equipment with you, and get your field trip book signed off. If you feel you are not as far along as you should be or find one of the stations particularly difficult for you, talk to an instructor or the field trip leader. In order to receive credit for the field trip, you need to complete all stations, and turn in your field trip book to the trip leader at the end of the day.

**NOTE: Know your knots, belays, and climbing signals! You were tested on these skills, and are expected to show proficiency.**

**Safety Rules**

All belayers must be anchored (simulating a multi-pitch rock climb) before starting to belay.

No one is permitted to climb un-roped on the rock. Except on traverse at the base if climbers are not above.

Helmets must be worn at ALL TIMES.

Gloves must always be worn when belaying and rappelling.

**Suggestions**

This is where you get to show your skills. Remember, your ability to safely belay will now be put to the test for real. You will have a person on the other end. On the rock you will be belayed at all times while climbing. Watch how the person ahead of you climbs the pitch. It will help you. Push your limits, see what you can do.

**RAPPELLING**

At this station we will practice rappelling and discuss rappel anchors. This is a critical skill, so make sure you come prepared. We will show you how to set up and let you rappel using the Carabiner Brake Rappel and Extended Device Rappel. We will also show you how and let you practice self-belay while on rappel using an autoblock and stopping mid-rappel with a leg wrap. Each student will get the chance to perform at least one belayed rappel from below also known as a fireman’s belay. The standard rappelling signals will also be introduced and practiced.

**RAPPEL SIGNALS**

Study the following signals, what they mean, and when they should be used.

|  |  |
| --- | --- |
| 1. “On Rappel” 2. “Rope” | 1. “Off Rappel” 2. “ROCK!! ROCK!! ROCK!!” (anyone) |

**EXTENDED RAPPEL DEVICE METHOD**

The Extended Rappel is the primary method of rappel taught in the Tacoma Basic Course due to its safety.

<https://www.mountaineers.org/blog/how-to-extended-rappel>

EXTENDED RAPPEL SET UP WITH AUTOBLOCK

THE SET-UP – While Waiting

1. Attach PAS to anchor.
2. Thread half of a double-length (120 cm) sewn sling through harness hard points and tie both ends into a figure eight on a bight.
3. Add carabiner and device through both distal loops.
4. Tuck hair and any loose objects out of the way.

WHEN NEXT UP TO RAPPEL

1. One can attach the autoblock and carabiner to the rope while the preceding climber is on rappel.
2. A properly sized autoblock will not slide down the rope when left on the rope.

SETTING UP

1. Attach autoblock to belay loop with its locking carabiner.ExtendedRappel1\_Updated.jpg
2. Pull rope up through autoblock to form bight of rope for threading device -the autoblock holds the weight of hanging rope strands.
3. With device located as close to anchor as practical thread rope bight through rappel device.
4. Clip device into both distal extending sling loops with carabiner.
5. Lock the carabiners.

TESTING

1. Review the system in a serial manner from anchor to landing: SERENE anchors, rope threading, autoblock, device, carabiner, belay loop, harness, stopper knots and landing.
2. Slide autoblock up toward device, and with gloved brake hand on both strands and being careful not to tension the PAS, loosen brake hand enough to weight the autoblock to make sure it will hold and that it cannot not reach into the device to defeat the autoblock.
3. With braking applied, slide autoblock down to create enough slack to body weigh the device while being careful not to tension the PAS or autoblock.

ON RAPPEL

STARTING RAPPEL

1. With brake hand on both strands well below device use other hand to remove PAS from anchor and stow.
2. Use brake hand to maintain friction.
3. Place non-brake hand on autoblock and begin sliding it.
4. To begin descent reduce friction in brake hand while sliding the autoblock.

WHILE RAPPELLING

1. One hand slides the autoblock while the other hand controls the braking friction on both strands of rope.
2. To change hands remove hand from autoblock and transfer brake control from one hand to the other, never letting go. Original brake hand will now manage autoblock.
3. If additional friction is needed slide brake hand under climbers seat.
4. In an emergency, or to engage the autoblock, let go of the autoblock while maintaining brake hand friction. Lessen friction only after autoblock is securely holding the rope.
5. To go hands free first assure the autoblock is holding. A leg wrap can be added for a greater security to the autoblock. To go hands free while hanging a back-up leg wrap is used as a back-up.

**CARABINER BRAKE RAPPEL METHOD WITH AUTOBLOCK**

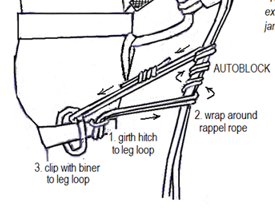
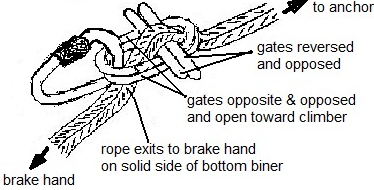
### Although complex, the Carabiner Brake rappel method is taught in the Tacoma Basic Climbing Course as a back-up in case you have forgotten or lost your belay device.

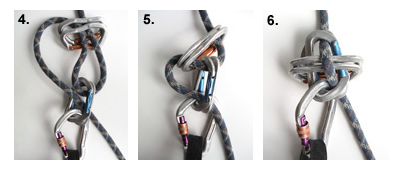
### CARABINER BRAKE RAPPEL SET UP

Step 1. Take 2 (preferable oval) carabiners and clip them to either a locking carabiner off your belay loop (as showing in the picture) or directly to your belay loop, the gates should be opposite and opposed.

Step 2. Pull a bight of rope through the opposite and opposed carabiners, pinching it to rope going to the anchor.

Step 3. Clip 2 carabiners (with gates reversed and opposed) through the bight and the climbing rope going to the anchor so the rope runs over the spines of the reversed and opposed carabiners.

Step 4. Figure 5 Slide the reversed and opposed carabiners over the opposite and opposed carabiners, making sure that the braking strands of the rope exits the opposite and opposed carabiners on the spine side of the bottom carabiner. 

Step 5. Girth hitch your autoblock to your leg loop of your seat harness.

Step 6. Wrap your autoblock up the rope (4 coils is recommended) and then clip the end of the autoblock back to the leg loop of your seat harness with a locking carabiner. Lock the carabiner.

Again, the brake hand rides above the autoblock to tend the coils as you rappel and the rappel rope should be to the side of the climber.

**RAPPEL SAFTEY BACK UP METHODS**

**Tying knots in the ends of the Rope**

You should ALWAYS have safety knots tied into the end of the rope, even if you can see that the rope touches the ground.

**Autoblock – Self Belay**

Auto blocks (friction hitches) are a great tool for self-belay while on rappel, and especially useful if the route suggests hazards of rock fall, etc. Assuming they are set up correctly they can enable you to stop a rappel without holding on to the rope. It is very important to make sure your autoblock is sized and set up correctly, because if done wrong it can get sucked up into the belay device and cause catastrophic failure. When on rappel, your brake hand is on the rappel rope(s) above and slightly over the autoblock knot. If the knot locks up use your hand to slide down the upper loops of the autoblock to continue the rappel.

Set-Up/Sizing

Step 1. Start with a 5 foot length of 6 mm perlon.

Step 2. Tie the perlon into a 15-16” length of loop using a double fisherman’s knot.

Step 3. Girth hitch the loop to the leg loop of your seat harness.

Step 4. Wrap the loop about four times around both strands of rope towards and below the rappel device.

Step 5. Clip the remaining tail of the perlon loop to your leg loop with a locking carabiner.

Step 6. If the autoblock is too long it will get sucked into the belay device and needs to be shortened.

Autoblock Use

* **This system is not foolproof!** The successful use of the autoblock rappel backup is dependent on several variables including the person’s harness, body weight, additional weight being carried on the rappel, length of autoblock loop and number of autoblock wraps on the rope.
* **All factors must combine in such a manner that there is no possibility of the autoblock knot entering the belay device**. If there is, the device may have to be extended away from the harness.
* **Four wraps is only a suggested starting point. The autoblock is a sliding friction knot. The ability of the knot to lock on the rope(s) and hold your weight depends on the rappel rope(s) diameter, the finish and cleanliness of rappel ropes, the diameter of the perlon cord and the number of wraps. This should be evaluated for each situation. There is always the potential the autoblock will not lock on the rope**.
* A climber must practice and develop **a reliable autoblock set up** on safe, practice rappels.
* Descend with brake hand on and above the autoblock loops, causing them to slide on the rope during descent. If autoblock locks, press on top of sliding knot to loosen.
* Descend slowly and smoothly – no bouncing! Bouncing stresses the anchors.

**Fireman’s Belay**

Another method of backing up (belaying) a rappel is for another member of the climbing party to belay the rappeller from below by holding the tail ends of the rappel rope(s) and pulling downward. The belayer must be holding the tail of the rope(s) such that they are able to pull it taut. This is useful if the rappeller somehow loses control of their brake and does not have another back up system in place.

**Leg Wrap – Stopping Mid-rappel**

# The leg wrap is a great tool if you need to stop mid-rappel and do not have a self-belay (autoblock) system in place. Take the break strand, and wrap the rope around your waist and then around one of your legs a minimum of 3 times. The friction and weight of the hanging rope off your leg should stop you, however, you can add wraps and/or tuck a bight of rope through one of the wraps to better hold the tie-off.Image result for arm rappel

**SCRAMBLE RAPPEL METHODS**

Rapple methods for un-roped parties on less technical terrain.

**Arm Rappel**

The arm rappel is typically used in easier lower risk but maybe loose terrain where setting up an actual rappel with gear might be cumbersome or over-the-top.

Set Up: Wrap the rope around your arms and across your back as seen in the picture, however, it is advised to wear long sleeves. Control the rappel with your grip.

**Prusik on a Handline**

Fixed hand lines are used on less technical but exposed terrain where a slip and/or fall could severely injure a climber, but is faster than belaying multiple party members across.

Set Up**:** Tie a properly dressed prusik knot (a loose or sloppy prusik will not bite the rope if a fall occurs) onto the fixed line, and secure it with a locking carabiner to the climber's belay loop of their seat harness. The climber slides the knot along the rope with one or both hands constantly checking the knot to ensure that it is snug and dressed.

**ROCK CLIMBING TECHNIQUES**

At this station, we will have multiple routes set up on the climbing walls. You will get a chance to practice the following climbing techniques:

* Friction/Slab
* Crack/Jam
* Rib/Arête
* Face
* Chimney
* Lieback

We will also discuss and let you practice cleaning rock protection. Make sure when you are cleaning protection from the wall you clip it to your harness first and then unclip it from the rope to prevent drops.

**LEAD BELAYS**

At this station we demo lead belays and catching a leader fall. You will then practice setting up, belaying a leader, and possibly catching a leader fall. Make sure you have read the difference between top rope belaying and leader belays from Field Trip 4 Prep, as well as practiced your belay set up and skills from Field Trip 2.

# FIELD TRIP #5 – ROCK 2

**Rock Climbing and Rappelling**

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| **FIELD TRIP #5– ROCK 2** | |
| **Date/Time:** | Date: May 8th, 9th, 10th  Starting Time: Arrive by 7:00 am and be ready to go by 7:30 am.  Duration: Approximately 8 hours |
| **Location:** | *Meet at Barney’s Rubble parking lot, Icicle Creek Road, Leavenworth* |
| **Directions:** | **Directions to Leavenworth / Barney’s Rubble Parking Lot**  Intersection of Highway 2 and Icicle Creek Road is on the west end (Stevens Canyon end) of Leavenworth. Allow at least 3 hours to drive to Leavenworth.  It is 4.3 miles from the intersection of Hwy 2 and Icicle Creek Rd to the Snow Creek Parking Lot. It is another 1.4 miles to Bruce’s Boulder (on left) and Barney’s Rubble (on right). The entrance road to the parking area is on the right side of the road (coming from Leavenworth) just past Bruce’s Boulder. The parking lot is NOT visible from the road. |
| **Purpose:** | * **Critical skills test**:Carabiner Brake and Extended Device Rappels * Practice autoblock rappel back up and leg wrap * Practice fireman belay * **Critical skills test**: Lead belaying * Practice Rock Climbing techniques * Discuss rock climbing hazard awareness * Practice cleaning protection * Discuss rappel and trad anchor setups |
| **Prerequisites:** | * Lecture #1, #2, #4 * Field Trip #1 Prep, #1, #2, #4 Prep & #4 * Passed the Knots and Belay Test |
| **Assignments:** | Study: Information contained in this section.  Information required for Field Trip # 4 |
| **Special Note:** | Consider staying overnight the night before – it’s a 3 ½ -hour drive. We have reserved a campground group site for instructors and students. You may arrive at the campground as early as 3 pm on Thursday, and must vacate by 2 pm on Sunday. The campground location will be announced in lecture and/or via email. |

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| **EQUIPMENT**  **See Required Equipment FT 5 on the Equipment Matrix (Lecture 1)** |

**PROCEDURE**

Rock II is your opportunity to practice/test the fundamental rock techniques learned at the Rock I Field Trip in a natural state. By the end of the day, you will not only have been able to practice your skills, but, just as important, you will have matured your climbing judgment by learning more about YOUR capabilities NOTE: You will be required to attempt all climbs in your mountaineering boots, however, if the instructors see that you are having difficulty they may let you change into rock shoes. Therefore it is advised to bring rock shoes if you have them.

Your leader will email you about a meeting time and place. Make sure you are ready to go by start time, as this can be a really long field trip if you are not. If you have never been climbing outdoors before, you will find out that crags are not always the easiest places to navigate, and you will need to follow the instructors to find the areas where you will be practicing your skills and techniques.

**SAFETY RULES**

* All belayers must be anchored in before starting to belay.
* No one is permitted to climb un-roped on the rock, and all must be anchored in at the top of a climb.
* Helmets must be worn at ALL TIMES.
* Gloves must always be worn when belaying and rappelling.
* NEVER LET GO OF THE BRAKE STRAND.
* Practice the discipline of not dislodging rocks. Test holds before pulling on them. Try to stay on route. If you do dislodge a rock or drop a piece of gear, yell “Rock, Rock, Rock.”
* Do not look up if you hear someone yelling Rock. Be aware of your surroundings, and try to move to safety and/or stay out away from the wall if you are not belaying.
* Do not step on the rope

**ROCK CLIMBING TECHNIQUES**

At this station, instructors will have set up ropes on different walls/areas so you can practice the different types of climbs and using the correct climbing techniques needed to ascend the routes:

* Friction/Slab – smearing and balance
* Crack/Jam – hand, finger, and foot jams
* Face – edging, crimp, pinch, and cling holds
* Chimney – counterforce techniques
* Lieback – arms extended, feet flat against the wall

When you start climbing on the rock, make sure you are using climbing signals, and it is recommended to start with easier pitches first, if you have little experience. Remember, the following principles while climbing:

1. Keep three-points contact with the rock.
2. Climb with the eyes - Plan the route ahead, looking for a good foot hold, and moving your feet up before looking/moving for your next hand position.
3. Keep your weight over the feet, and avoid reaching too high.
4. Test all hand and footholds before applying full weight/pressure.

**ROCK CLIMBING – CLEANING ROCK PROTECTION**

On some of these routes instructors will be placing rock protection for you to practice cleaning. It is ideal to have your nut tool in a handy spot on your harness for ease of use and to put a leash on it so you don’t accidently drop it. Make sure to be very careful with removing the protection and give cleaning the protection a good try before leaving it behind, the cost of a lost pieces can range anywhere from $10-$150.

Remember:

Step 1. Think about how the leader might have put the protection in the wall.

Step 2. Remove the protection from the wall, in the reverse order of how you think it might have been placed.

Step 3. Clip the piece to your harness.

Step 4. Unclip the sling from the rope and clip it to your harness or put it around you.

**ROCK CLIMBING – LEAD BELAYING**

On other routes, instructors will have you test the Critical Skill of lead belaying. Make sure to go back to Field Trip 2 to remember how to set up a belay and climbing signals, if you don’t remember. Pay strict attention to the climber, rope and your belaying responsibilities. GUARD AGAINST LETTING YOUR MIND WANDER WHILE YOU ARE BELAYING. Keep your braking hand in proper position at all times and wear gloves while belaying. Don’t worry we will build the anchors, but the rest is on you. Keep in mind, THIS IS A TEST.

**ANCHORS**

At this station, we will discuss Tradition Rock anchors and Rappel anchors. It would be wise to read/understand what a SERENE anchor is and how to recognize one.

**RAPPELS**

At this station, we will be testing your ability to set up and safely perform the Critical Skill of a rappelling. You will be required to perform 3 total free hanging rappels. You must pass this skill before being allowed to participate in rock climbs.

1. Carabiner Brake Rappel with autoblock
2. Extended Device Rappel with autoblock
3. Extended Device Rappel with leg wrap and fireman belay from below.

SAFE RAPPEL

Step 1: Attach your PA to the anchor when you get to the rappel station

Step 2: Ask the instructor/leader if there are knots in the end of the rope. DO THIS EVERY TIME!

Step 3: If the instructor says yes there are knots in the end of the rope, go ahead, take the rope, and set up your autoblock. (Setting up your autoblock first helps to hold the rope and makes it easier to set up the device).

Step 4. Set up the carabiner brake rappel or device, correctly attaching it to the rope.

Step 5. Test each system (autoblock and rappel method) to make sure they are holding, and fix them if they are not.

Step 6. Place hand on the brake strand.

Step 7. Unclip your PA from the anchor and back to your harness.

Step 8. Yell “on rappel”, then sit back, and slide the auto block down the rope with your brake hand.

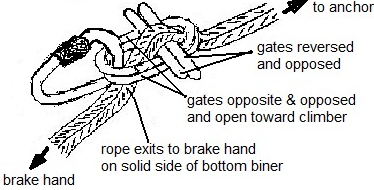
REMEMBER: NEVER let go of the brake strand unless told to do so by the instructor. ALWAYS ask or make sure the instructor put knots in the end of the rope.

**CARABINER BRAKE RAPPEL METHOD WITH AUTOBLOCK**

### The Carabiner Brake rappel method is taught in this course as a back-up system in the case of you having forgotten or lost your belay device.

### CARABINER BRAKE RAPPEL SET UP

Step 1. Take 2 (preferably oval) carabiners and clip them to either a locking carabiner off your belay loop (as showing in the picture) or directly to your belay loop, the gates should be opposite and opposed.

Step 2. Pull a bight of rope through the opposite and opposed carabiners, pinching it to rope going to the anchor. 

Step 3. Clip 2 carabiners (with gates reversed and opposed) through the bight and the climbing rope going to the anchor so the rope runs over the spines of the reversed and opposed carabiners.

Step 4. Slide the reversed and opposed carabiners over the opposite and opposed carabiners

Step 5. Making sure that the braking strands of the rope exits the opposite and opposed carabiners on the spine side of the bottom carabiner.

**CARABINER BRAKE RAPPEL AUTO BLOCK SET UP**

Step 1: Girth hitch your autoblock to your leg loop of your seat harness.

Step 2. Wrap your autoblock up the rope (4 coils is recommended).

Step 3. Clip the end of the autoblock back to the leg loop of your seat harness with a locking carabiner.

Step 4. Lock the carabiner.

NOTE: Make sure the double fisherman’s knot is not:

* 1. In the loops around the rope of your autoblock
  2. In the girth hitch knot
  3. At the very end of the perlon touching the locking carabiner.

**EXTENDED RAPPEL DEVICE METHOD**

* The Extended Rappel is the primary method of rappel taught in the Tacoma Basic Course due to its safety.
* <https://www.mountaineers.org/blog/how-to-extended-rappel>

EXTENDED RAPPEL SET UP WITH AUTOBLOCK

THE SET-UP – While Waiting

1. Attach PAS to anchor.
2. Thread half of a double-length (120 cm) sewn sling through harness hard points and tie both ends into a figure eight on a bight.
3. Add carabiner and device through both distal loops.
4. Tuck hair and any loose objects out of the way.

WHEN NEXT UP TO RAPPEL

1. One can attach the autoblock and carabiner to the rope while the preceding climber is on rappel.
2. A properly sized autoblock will not slide down the rope when left on the rope.

SETTING UP

1. Attach autoblock to belay loop with its locking carabiner.ExtendedRappel1\_Updated.jpg
2. Pull rope up through autoblock to form bight of rope for threading device -the autoblock holds the weight of hanging rope strands.
3. With device located as close to anchor as practical thread rope bight through rappel device.
4. Clip device into both distal extending sling loops with carabiner.
5. Lock the carabiners.

TESTING

1. Review the system in a serial manner from anchor to landing: SERENE anchors, rope threading, autoblock, device, carabiner, belay loop, harness, stopper knots and landing.
2. Slide autoblock up toward device, and with gloved brake hand on both strands and being careful not to tension the PAS, loosen brake hand enough to weight the autoblock to make sure it will hold and that it cannot not reach into the device to defeat the autoblock.
3. With braking applied, slide autoblock down to create enough slack to body weigh the device while being careful not to tension the PAS or autoblock.

ON RAPPEL

STARTING RAPPEL

1. With brake hand on both strands well below device use other hand to remove PAS from anchor and stow.
2. Use brake hand to maintain friction.
3. Place non-brake hand on autoblock and begin sliding it.
4. To begin descent reduce friction in brake hand while sliding the autoblock.

WHILE RAPPELLING

1. One hand slides the autoblock while the other hand controls the braking friction on both strands of rope.
2. To change hands remove hand from autoblock and transfer brake control from one hand to the other, never letting go. Original brake hand will now manage autoblock.
3. If additional friction is needed slide brake hand under climbers seat.
4. In an emergency, or to engage the autoblock, let go of the autoblock while maintaining brake hand friction. Lessen friction only after autoblock is securely holding the rope.
5. To go hands free first assure the autoblock is holding. A leg wrap can be added for a greater security to the autoblock. To go hands free while hanging a back-up leg wrap is used as a back-up.

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# FIELD TRIP #6 PREP – CREVASSE RESCUE PREP

**Prep for Crevasse Rescue Test**

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| **FIELD TRIP #6 PREP – CREVASSE RESCUE PREP** | |
| **Date/Time:** | Date: May 27th OR 28th  Starting Time: 6:30 pm (Arrive by 6:15 pm and be ready to start at 6:30 pm)  Duration: Approximately 3 hours |
| **Location:** | *Old Town Park- West of Tacoma Club House- N 30th Street (outside)* |
| **Prerequisites:** | * Attend lecture #5 |
| **Assignments:** | * Reading: *Freedom of the Hills, 9th edition*   Glacier Travel and Crevasse Rescue …………. Ch 18   * Study: Information contained in this section   Information required for Lecture 3 |
| **Purpose:** | Practice 3:1 (Z) pulley crevasse rescue system  Practice 2:1 (C) pulley crevasse rescue system  Talk about Direct Pull crevasse rescue |

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| **EQUIPMENT**  **See Required Equipment FT 6 P on the Equipment Matrix (Lecture 1)** |

**PROCEDURE**

When you get to the clubhouse, put your gear on and find a group. You will need to start practicing the 2:1 (C) pulley and 3:1 (Z) pulley team crevasse rescue methods.

For the 3:1 (Z) pulley method, you will have 20 minutes to set up the system and start “rescuing” your fallen climber. Instructors are expecting that you come prepared knowing the steps of the rescue at this field trip. They are expecting you to be ready, and to be refining your technique. This is your last chance to ask questions before you get tested on this essential skill.

Note: Practice should be done with gloves on since this is the most likely scenario in a climbing situation.

## CREVASSE RESCUE RESPONSE [[SEE QUICK OVERVIEW AND TESTING GUIDE HERE](https://docs.google.com/document/d/1u49XQ20RYUJBlJdDHGwBZRkjT8Z8NhJ8djojLiKg2hY/edit?usp=sharing)]

## It should be understood, that with many systems and techniques in climbing, the best method to use or system to build, how to build it, and the order in which it is built, is dependent on the situation and gear at hand.

### With this being said, crevasse rescue is another one of those situations and systems. Some of the major considerations, when determining the best a crevasse rescue plan, are going to be:

1. Which climber fell into the crevasse.
2. Snow pack analysis, which determines:
   1. The type of initial anchor that should be used (vertical top clip or mid-clip picket).
   2. Whether or not you should build a second anchor before or after the middle climber gets up.
   3. If the rope is likely to be wet and icy or deeply entrenched in the snow.
3. Number of climbing teams available.
4. The terrain – are you on a steep slope or are there many crevasses around?
5. Condition of the victim.

Minor considerations:

1. Using a Bachmann or a prusik to the initial anchor.
2. Should your chest prusik go between both pulleys or on the tail behind the travelling pulley.
3. Should you use your ice axe or backpack to pad the lip.

### With all these things (and more) to consider, you should understand that there are many ways to perform crevasse rescue. In the Tacoma Basic Climbing Course we are only teaching one basic method. So as you read through the steps below, make sure you understand that the noted assumptions make it so that the way we are teaching it, is what we believe to be the best way possible, given the provided situation. Once you get these basic steps down, try to think about the other ways you could perform this skill if the situation was different.

### BASIC STEPS OF CREVASSE RESCUE

### Arrest the fall

1. Set up an anchor
2. Communicate with the victim
3. Devise a plan
4. Carry out the plan

### SUMMARY OF THE STEPS OF CREVASSE RESCUE

STEP 1: ARREST THE FALL

Assumption/Situation: the first or last climber is the victim and cannot get out of the crevasse on their own.

1. First Response – the victim/end climber yells “FALLING” and then falls into the crevasse. NOTE: The whole team should yell “falling” too as soon as they hear it, and instinctively jump into arrest position.
2. The remaining rope team members (lead and middle climber) arrest the fall.
3. Climbers yell to each other, trying to figure out what happened, and then start to devise a plan.
   1. The middle climber tries to communicate with the fallen climber.
   2. The middle climber communicates the situation to the lead climber.
   3. The lead climber asks the middle climber if they are able to hold the fallen climber’s load.\*
   4. Assuming yes, the lead climber slowly gets up to transfer the full load of the fallen climber to the middle climber. NOTE: if the middle climber starts to slip, the lead climber needs to immediately get back into arrest position.
4. The lead climber quickly prusiks (using their seat harness prusik) and probes the snow as they travel back towards the middle climber.

\*NOTE: If the middle climber has fallen into the crevasse, the climbers must decide which side of the crevasse will be the rescue side (i.e. which side the fallen climber will come out of). Typically, one climber will be holding more of the weight than the other climber. The climber holding the least weight has the best chance to establish an anchor system while the other climber stays in self-arrest to hold the fall. After the anchor system is set-up, the climber on the rescue side now must belay the other climber over to the rescue side to help perform the rescue. It is most common for the first or last person on the rope team to fall into a crevasse, however, so for the purposes of instruction, the remaining instructions pertain to that situation. We are not currently testing on or practicing this scenario in the basic course but encourage you to do your own research and practice for this scenario.

STEP 2: SET UP THE ANCHOR

1. Once the lead climber reaches the middle climber, they evaluate the surroundings by continuing to probe the snow around both sides of the middle climber and about 5-10 feet below the middle climber’s feet; determining if the area is safe.
2. Assuming the area is safe, the lead climber begins to set up the initial part of the rescue system. This system is comprised of an anchor system (initial and secondary anchor) attached and secured (using friction hitches and back up knots) to the victim’s end of the rope.

***NOTE: As mentioned above, the anchors used and sequence of the following steps are very situationally dependent. It is okay to have some variance in these steps when testing so long as you can sufficiently explain the critical thinking behind your decisions made during the rescue and there are no critical skill errors that could result in death or injury.***

* 1. Build the initial anchor: Vertical Top Clip Picket. Assumption: On a gentle slope and the snow pack is knife hard (see anchors information in FT 7).

**Vertical Top Clip Picket Characteristics:**

* + 1. The top hole of the picket is girth hitched using a single or short sling.
    2. Placed inline/parallel with the rope.
    3. Placed 5-10 feet down from the feet of the middle climber.
    4. Placed 15-25 degrees back from perpendicular to the slope.
    5. Hammered in until the sling meets the snow line of the slope
  1. Attach the anchor to the rope.
     1. Tie a Bachmann hitch to the rope.
     2. Attach the single/short sling off the picket to the perlon of the Bachmann hitch with a locking carabiner. Lock the carabiner.
     3. Slide the Bachmann hitch down the rope toward the fallen climber, tensioning the anchor.
  2. The lead climber now guards the anchor (putting their uphill foot over the sling next to the head of the picket), let the middle climber know they can slowly start to stand up.
  3. The middle climber slowly gets up, as the lead climber watches to make sure the Bachmann knot catches and holds the load. If the bachmann knot does not hold, the lead climber should immediately stop the middle climber from getting up, and fix the problem.
  4. The middle climber comes over, personal anchors into the sling of the initial anchor, and then swaps places with the lead climber, guarding the initial anchor. They should remain ready to arrest again if the anchor fails.
  5. The lead climber now attaches a pulley to the loose section of rope, and clips the pulley with a non-locking carabiner to the locking carabiner of the anchor.
  6. The lead climber backs up the system by tying a figure eight on a bight behind the pulley (on the loose rope toward the middle climber), and clips it into the non-locking carabiner of the pulley.
  7. The lead climber takes the middle climber’s picket (which should have a double runner girth hitched to the center hole and a locking carabiner on the end of the sling) and builds a secondary anchor.

Secondary Anchor: Deadman

**Deadman Characteristics:**

Assumptions: On a gentle slope and the snow pack is knife hard (see anchors information in FT 7)

* + 1. The slot for this anchor sling should be at about a 30 degree angle with the initial anchor.
    2. The depth of the trench for the picket should be at least as deep as the object (ie. 24 in. picket, 24 in. deep trench).
    3. The picket should be perpendicular to the direction of pull.
  1. The lead climber goes back to the middle climber, who:
     1. Gives the lead climber a pulley and prusik on a non-locking carabiner.
     2. Unties from the rope.
     3. Continues to monitor and guard the anchors.

STEP 3: COMMUNICATE WITH THE VICTIM

The end climber now prusiks and probes down to the lip of the crevasse to assess the situation and evaluate the victim’s condition. They need to find out:

1. Is the victim conscious?
2. Is the victim injured?:
   1. Does the victim need immediate help, and someone should be belayed down to them?
   2. Will the victim be able to self-rescue?
3. How badly entrenched is the rope in the lip of the crevasse?

STEP 4: DEVISE A PLAN FOR RESCUE

For simplicity and basic testing purposes we will assume the following:

NOTE: You willalso be tested on gear management. If you drop an item of gear, you can no longer use it and it will be taken away. If you intentionally put it/stake it down, you can keep it.

A. The Victim:

1. The victim is an end climber

2. The victim is conscious.

3. The victim is not so badly hurt that teammate needs to rappel down and give immediate assistance.

4. The victim cannot self rescue.

B. There will be 2 situations tested, with the following assumptions for both:

- You are on mellow terrain, so there is a low possibility of the lead climber slipping and falling into the crevasse.

* 3: 1 (Z) Pulley System Test, Additional assumptions:
  + Your team is the only team available for rescue.
  + The rope is not so badly entrenched that you can't pull the victim out of the crevasse.
* 2:1 (Single/C) Pulley System Test, Additional assumptions:
  + You have a second team to assist with the rescue.
  + This team is needed because either:

1. The rope is so badly entrenched that you must use a second rope to pull the victim out of the crevasse.
2. This is a faster method to help the fallen climber.

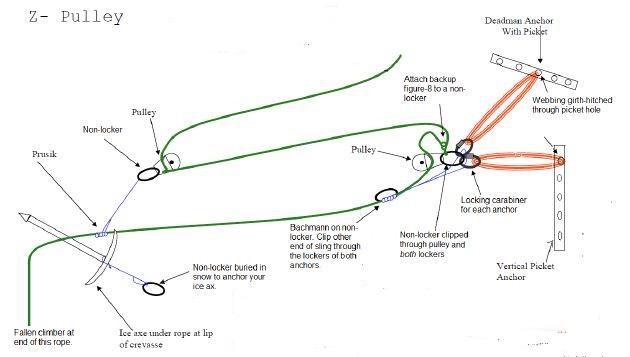
STEP 5: CARRY OUT THE PLAN

1. Implement the method and perform the rescue.
2. 3:1 (Z) Pulley System Test - now that you know the situation of the climber follow these steps.
   1. Pad the lip of the crevasse - placing an ice axe under the rope (the head of the ice axe should be facing downhill), and put a non-locking carabiner on the leash and bury it in deeply in the snow.
   2. Tie a prusik to the rope (leading to fallen climber). Then take the loose rope (the rope between the lead and middle climber), and attach a pulley using a non-locking carabiner to attach the pulley to the prusik.

NOTE:

A. Rope management is important in this step. Make sure you attach the prusik at a spot on the rope that will allow you to get back to the anchor.

B. Make sure the lead climber’s seat prusik is on the rope between the second pulley and the rope attached to themselves. Not between the two pulleys.

* 1. The lead climber now (using their seat prusik) prusiks back to the anchor and the middle climber.
  2. The lead climber personal anchors into both slings of the initial and secondary anchor.
  3. Now the lead and middle climber begin to pull hand over hand on the rope. The middle climber needs to monitor the bachman knot and the lead climber needs to pull while tending their seat prusik.
  4. Likely you will not be able to pull the fallen climber out in one try, and will need to reset the system. 

1. 2:1 (Single/C) Pulley System Test – you are in luck a second team is here to help.

1. The lead climber needs to pad the lip. Same as above.

2. Return to the anchor and personal in.

Second Team – Sets up the 2:1 single pulley double rope system.

NOTE: Lead climber is climber 1, middle climber is climber 2, and end climber is climber 3. Climber 2 may need to re-tie in closer to climber 3 depending on the amount of rope needed to get to the fallen climber.

1. Second team approaches the first team and (for time sake) climber 2 and 3 clove hitch/personal in to both slings of the anchor system set up by the first team. This team could (and potentially would) build their own anchor system if the second rope needed to be set up somewhere else and/or if snow conditions warrant a second anchor.
2. Climber 2 belays Climber 1 to the lip of the crevasse – using the seat harness prusik belay, carabiner ice axe belay, or belay device/munter hitch tending with the rope with the seat prusik.
3. Climber 1 builds an anchor system (same as in the first system) with 2 of the following types of anchors: a vertical top clip picket (if snow conditions are right for it), vertical mid-clip picket and/or a Deadman, and then clips a locking carabiner to the slings of the anchors and clove hitches the rope to the locker.
4. Climber 1 pads the lip of the crevasse (using their backpack or ice axe) to keep the rope from entrenching, where the rescue rope will pass over the lip.
5. Climber 1 attaches a pulley and locking carabiner to a bite on the rescue rope.
6. Climber 1 lowers the pulley and locking carabiner to the fallen climber, and instructs them to clip the locking carabiner to their belay loop on their seat harness, making sure that the rope that is being pulled by the team is coming out of the top of the pulley.
7. Climber 1 then lets the rest of the team know that the fallen climber is ready to be pulled out of the crevasse. Climber 1 needs to monitor and guard their anchors and try to monitor the progress of the fallen climber and communicate the climber’s needs to the rest of the rescue team.
8. The remaining climbers (lead climber of the first team, Climber 2, and Climber 3) start to pull the fallen climber out of the crevasse with the secondary rescue rope.

NOTE: At this time, it is critically important for the middle climber to pull the slack out of the system in the original accident rope, so the Bachmann can grab if someone slips or the rescue team needs a break. Keep the existing back up figure eight on a bight tied to the anchors while the other climbers are pulling. Retie the figure 8 after the Bachmann bites the rope again.

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# FIELD TRIP #6 –CREVASSE RESCUE

**Team Crevasse Rescue Test**

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| **FIELD TRIP #6 CR – CREVASSE RESCUE** | |
| **Date/Time:** | Date: Saturday, June 6th, 2020  Starting Time: Arrive by 6:30 am and be ready to go by 7:00 am.  Duration: Eight to ten hours |
| **Location:** | *Panorama Point area, Mt Rainier National Park*  *Meet at Paradise upper parking lot, Mt Rainier National Park* |
| **Directions:** | Go East on SR 512 to SR 7. South on SR 7 to SR 706 in Elbe. East on SR 706 through Ashford to the Nisqually Entrance. Pay entrance fee and continue on to Paradise. |
| **Prerequisites:** | * Lectures: 1, 3, 4 and 5 * Field Trips: #1 Prep, #1, #2, #3 and #6 Prep * Pass a conditioner hike (2nd year students must also complete a conditioner in the current year prior to this field trip) |
| **Assignments:** | * Study: Information contained in this section.   Information and reading required for Field Trip #6 Prep  Information required for Lecture 5 |
| **Purpose:** | * **Test** on 3:1 (Z) pulley crevasse rescue system * **Test** 2:1 (single/C) pulley crevasse rescue system * Practice prusiking |

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| --- | --- |
| **EQUIPMENT**  **See Required Equipment FT 6CR on the Equipment Matrix (Lecture 1)** | |
| **Special Notes & Items** | * Map: USGS map “Mt Rainier East” * Drivers need a current ***National Park Pass*** or pay ***National Park entrance fee*** |

**PROCEDURE**

The goal of this field trip is to test the Essential Skills of Team Crevasse Rescue. When you arrive at MRNP, head up to the Paradise Overnight Parking Lot (same place you parked for FT3). Get your gear ready for a day “out on the glacier.” Make sure you have adequate food, clothing, and sun protection. It can get very hot out there.

Once everyone has arrived, instructors will check the adequacy of your clothing, ten essential systems, and equipment to go out for the field trip. We will then walk as a group to the testing area. Don’t fall behind, instructors are watching for adequate conditioning too. When we arrive at the testing area (possibly before), we will split into teams of 3-4 students. Each person will get the chance to be the fallen, middle and lead climber, taking turns performing and being evaluated in each role. NOTE: The fallen climber will be on belay at all times when near or in the crevasse/edge.

You are expected to know your knots, snow anchors, how to rope up, have your gear ready for each position on the rope, and perform an ice axe arrest. You are also expected to show up prepared with the right equipment and know how to use it. **If you do not have all equipment and clothing you will not be permitted to participate.**

NOTES:

* Parking is limited at Paradise, so please **maximize** carpools, especially from Longmire.
* All students are expected to be the fallen climber at least once, and at other times as requested by your instructors. Your patience and attention to your instructors will greatly expedite this practice.
* Nobody will leave the parking lot until all people are accounted for.
* Make plans to stay overnight Friday and Saturday night, that way you will be well rested and ready for testing. Field Trip Leaders will have a group site reserved at a nearby campground for both nights.

### CREVASSE RESCUE

### RESCUE METHODS

If the victim is able, he or she may be able to extricate themselves. As the climber in the crevasse, ALWAYS begin self-extrication. During a climb, the object of crevasse rescue is to remove the fallen climber from the glacier, not to set up a complicated pulley system. If you are the fallen climber, you should make every effort to **establish** **and** **maintain communication** if able. Most times a fall is shallow (knee deep to a foot over your head); simply pull yourself out. If you find yourself hanging, begin the prusiking procedures you learned at Field Trip 2. If you are wedged, do all you can to make sure your team knows it, and try to get yourself free. Stay calm and use your head; it’s your best piece of equipment.

If the victim cannot extricate himself, then the rest of the party must chose a method to assist the victim out of the crevasse. The choice of which method to use is a decision that must balance available person power against the time and equipment needed. The choice is also influenced by the condition of the victim and whether the rope is entrenched in the lip.

**Needed Person Power Method Time and Equipment**

Direct Pull

DECREASES Single Pulley (C-Pulley) INCREASES

Z-Pulley

**FIRST CHOICE** should be direct pull if the pulling power is available. This could be 2 or more rope teams.

**SECOND CHOICE** should be the single pulley method if 2 or more rope teams are available.

**THIRD CHOICE** should be the Z-pulley method which can be done with 1 or more rope teams.

***Note:***  Don’t use a more time-consuming system when you have the available power to carry out a quick rescue. On Mountaineers Glacier climbs, you will be travelling with more than one rope team so it is advised to employ all teammates to use the quickest and safest method possible to rescue the victim.

### 3: 1 (Z)-PULLEY CREVASSE RESCUE TEST PROCEDURE

Crevasse rescue can involve many different scenarios. During this field trip we cannot practice all the possible variations because of time limitations, and therefore you will have 30 minutes to run through the given scenario. In each scenario, the team will set up, implement, and be evaluated on the Z-pulley method for rescue. 

The following describes the step by step procedure for performing the Crevasse Rescue operation on this field trip using the 3:1 (Z) Pulley system with a one three-person rope team. The narrative describes the process and actions required. This information is depicted in the figures shown on the pages following the narrative.

***Note:*** You will be required to follow the step by step method below. If you do something different, you will need to explain why, and as long as it is safe, you will still pass.

1. **INITIAL FALL**

**ROPE TEAM ARREST**

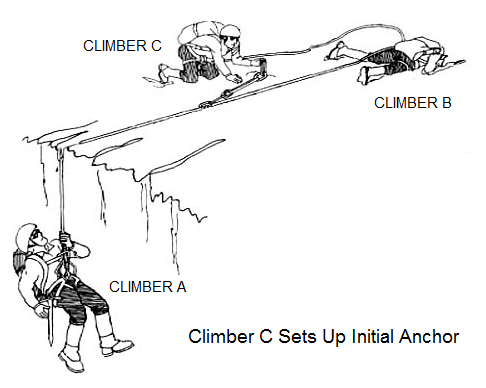
Climber A has fallen into a crevasse. Climbers B and C have immediately gone into ice axe arrest and arrested the fall with their feet entrenched against the direction of pull and the rope to the victim taut.

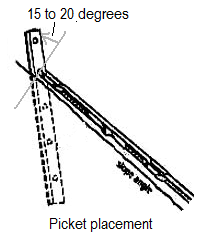
**Note to the victim – Climber A**: If you are climber A in the crevasse you should have your ice axe leash on your wrist (see the discussion on ice axe leash in the *Freedom of the Hills*, pg 309) and be sure you have your pack sling/perlon or a short sling girth hitched to your pack**.** **Be sure your gear, harness, and tie in are checked out by a teammate or instructor before entering crevasse. Wear something that will keep you dry and warm as you will be in at least ½ hour with ice water dripping down. Before approaching the crevasse lip or descending, check to be sure your belayer has you on belay (use climbing commands).** After descending (falling), you will clip the short sling from your pack onto the climbing rope between the seat harness and your prusiks, remove your pack, and carefully let it be suspended by this sling from the rope. Clip your ice axe to your harness and let it dangle. Then proceed to set up your Texas Prusiks. Do not start to climb with your Texas Prusiks until you are told the rope is anchored, then climb a few feet up the rope while awaiting rescue. You will want to unclip from chest harness when at lip of crevasse during rescue so as to safely negotiate yourself across lip.

**2. FIRST STEP**

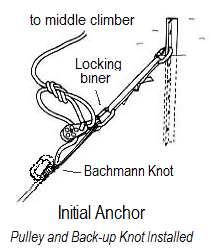
**SET UP ANCHORS, ATTACH AND SECURE THE ROPE TO THE VICTIM**

***Note: THIS IS DONE IN ANY CREVASSE RESCUE SCENARIO.***

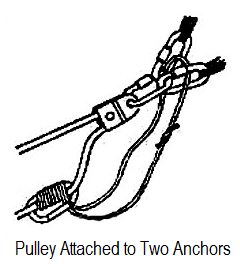
A) **SET UP INITIAL ANCHOR**

1. Climber C (end-person) communicates with Climber B (mid-person) that he/she intends to slowly transfer the load of Climber A (the fallen climber) to Climber B to see if Climber B can hold the load alone.
2. If Climber B can hold the load, Climber C self-belays him/herself on the rope to Climber B by using his/her seat harness prusik sling (which is already tied into the rope). Climber C continues probing for hidden crevasses with his/her ice axe, prepared to arrest if Climber B needs help.
3. Climber C then probes the area around climber B to detect any hidden crevasses and then proceeds to establish an initial anchor between climber B and the fallen climber. Choose a spot near the rope to the victim, about 5 to 10 feet from Climber B, toward the victim. Climber C drives his/her picket in the slope at an angle of 15 to 25 degrees back from perpendicular to the slope, away from the direction of pull, to establish this initial anchor. A short or single webbing sling is attached to the picket at the snow line with a girth hitch. Next a Bachmann knot is tied to the climbing rope leading to the fallen Climber A using a short perlon sling and carabiner. The loop from the Bachmann knot is clipped into the webbing from the anchor using a locking carabiner. Slide the Bachmann away from the anchor until tight to the anchor.

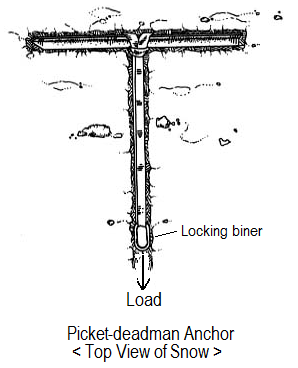
**Note:** A picket for the initial anchor is preferred. If no picket is available an ice axe can be used to establish this initial anchor. However, using an ice axe precludes C (and ultimately B’s) ability to self-arrest if the anchor fails.

1. Climber C guards this anchor by placing his/her uphill boot on the webbing adjacent to the anchor picket and takes a wide stance with the other boot toward fallen Climber A. Care shall be taken when wearing crampons.
2. Climber C, communicating with Climber B, tells initial anchor is in place; and Climber B slowly transfers the load of the fallen climber to the anchor. If the anchor holds, Climber B then stands up, clips into the anchor sling with his/her personal anchor/sling and takes over guarding the anchor by facing Climber C, placing one boot on the short/single sling between the anchor and the anchor carabiner and takes a wide stance with the other boot toward the fallen Climber A. **Climber B MUST then guard this anchor until the rescue is complete.** If the anchor fails the whole rope team can be pulled into the crevasse. Climber B holds his/her ice axe in a ready to arrest position.
3. Climber C places his/her rescue pulley on the now unweighted bight of climbing rope between Climber B and the Bachmann knot and uses a carabiner to clip the rescue pulley to the anchor carabiner (this shall be non-locking). It is easier to put the pulley on now, even though the team may decide to do a direct pull or C pulley.
4. Climber C then takes a bight of rope between Climber B and the pulley, ties a figure 8 loop and clips it into the pulley’s carabiner. This is a backup, in case the Bachmann slips.

B) **SET UP BACK-UP DEADMAN ANCHOR**

1. While Climber B continues to guard the initial anchor, Climber C sets up the Main anchor, a deadman. This anchor must be strong enough to hold the full weight of the fallen Climber A for long periods and possibly the climbing party. Climber B and Climber C collaborate on equipment. Climber C needs another picket, double runner, 2 locking carabiners, 2 oval carabiners, a pulley, a leader tie off sling, and a shovel.

**Note:** Every rope team on a glacier climb should carry at least one shovel.

1. Climber C attaches a double runner with a locking carabiner clipping through both the tie off loop from the Bachmann and rescue pulley carabiner. An additional double or single runner can be attached, extending them both, to help locate the position of the main anchor. The webbing, attaching the main anchor to the initial anchor carabiner, should not have any slack when attached to the main anchor.
2. The main anchor should be further away from the crevasse than the initial anchor and as much as possible inline with the direction of force from the fallen climber (also at no more than a 30-degree angle to the initial anchor).
3. **Note**: In well consolidated snow, the best main anchor is a deadman made with a picket. Using an ice axe, dig a pit perpendicular to the direction of pull and lay in the picket with a runner attached (girth hitched or with a carabiner to the center hole on the picket). You may either tie or girth hitch a sling (single or double), to the middle hole of the picket. Extend out the runner in a channel toward the initial anchor. The deadman picket should be located so the double runner attaches to the bachman and pulley biner location. There should be little or no slack in the system. Cover the deadman and stomp the snow securely.
4. DO NOT GIRTH HITCH AROUND THE ENTIRE PICKET AS SHOWN IN THE FIGURE TO THE RIGHT, ONLY GIRTH HITCH THROUGH THE HOLE. A GIRTH HITCH AROUND THE ENTIRE PICKET MAY CAUSE THE FINS TO COLLAPSE UNDER LOAD AND POSSIBLY CAUSE THE ANCHOR TO FAIL.

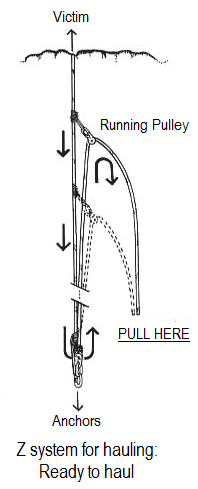
**3. SECOND STEP**

**EVALUATE VICTIM &SITUATION; DEVISE A PLAN FOR RESCUE**

1. Once the Main anchor is in place Climber B (mid-person) then unties from the rope to free it for use in the rescue. Climber B continues to guard the initial anchor.
2. Climber C (end-person) then makes sure his harness prusik attached to the climbing rope is positioned such that he/she is taut to the anchor and proceeds to self-belay himself/herself to the lip of the crevasse by sliding the prusik knot along the rope while probing with an ice axe for hidden crevasses.
3. At the edge of the crevasse, Climber C further determines the status of the fallen Climber A, evaluates his/her condition, and determines whether he/she will be able to help with rescue (assure the victim they are being rescued).
4. Climber C also evaluates the condition of the rope leading into the crevasse to the victim as to the extent it is dug into the lip of the crevasse (entrenchment).
5. Based on the evaluation and the resources available, this is the time in a REAL Crevasse Rescue to make a choice of rescue methods: Direct Pull vs. “C” pulley (“single rope” or “double rope” set-up) vs. “Z” pulley.

* The Direct Pull method is preferred, as no additional setup is required. However, a second team is required to provide pulling power.
* A “C” pulley **will** be required if the victim’s rope is severely entrenched. A “single rope” or a “double rope” system may be employed to overcome the entrenchment. (Normally the victim must be conscious and able to clip a carabiner to their harness to use the “C” Pulley.) The “single rope” system is set-up using the victim’s rope. If there is not enough rope to reach the victim, the “Z” pulley should be used to bring the victim to the crevasse edge, and then the “C” pulley should be placed to overcome the rope entrenchment. A “double rope” setup may also be used. This requires the use of a second team’s rope to reach the victim. (See the complete setup narrative under “Single or C Pulley System Double rope set-up”)
* Both the “single” and “double rope” setups require a second team to provide pulling power.

1. **For the purposes of this field trip the plan of choice will be the single rope team Z-Pulley rescue**. Everyone must demonstrate his/her proficiency at each role of the Z pulley method. We will also set up and perform the Single pulley (AKA “C” pulley) rescue.

Climber C pads the rescue rope leading to the victim to prevent it from digging any further into the snow by placing an ice axe under the rope, as close to the edge as possible. Drive the pick into the snow (adze up and to downhill side to prevent rope from slipping off). This ice axe is anchored by putting a carabiner on a sling girth-hitched to the ice axe (or the leash) and burying the carabiner and some of the sling in a hole scooped in the snow away from the head of the ice axe. Climber C may also need to chop/clear a pathway in the lip so Climber A can be pulled over the lip (**Caution**: This will rain debris on Climber A).

1. **Always perform the steps above (#1 - #3) in any crevasse rescue scenario – rope team arrest, set up the anchors, evaluate the victim’s condition, and THEN choose the rescue system, such as a direct pull.**

**4. THIRD STEP:**

**IMPLEMENT THE PLAN**

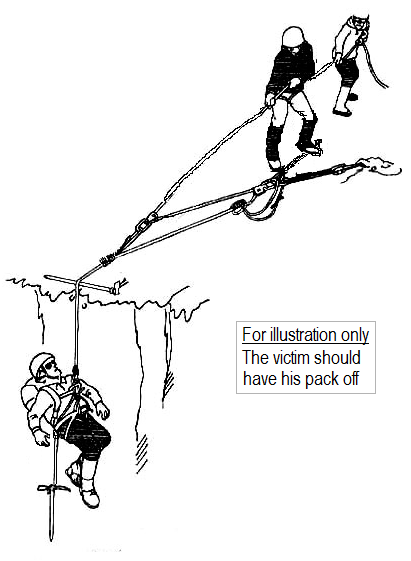
##### SETTING UP Z-PULLEY

3:1 Mechanical Advantage (see sketch at right)

1. **End person (Climber C) uses a leader tie-off loop to tie a prusik knot on the** rope leading to fallen the victim (climber A) in the crevasse. The location of this prusik knot is several feet back from the crevasse lip.
2. Climber C then takes the rope section leading back to the anchor and first pulley and attaches the second pulley, clipping it into the prusik loop from the victim’s rope with a carabiner. There is nothing else between the two pulleys (other than the backup Figure 8 loop). Climber C then self-belays back to climber B at the anchor, clips into the anchor with his personal anchor sling, and removes the backup figure 8 knot from the anchor and unties it.

**5. FOURTH STEP:**

**PERFORM THE RESCUE**

Climbers B & C pull hand over hand on the climbing rope until the two pulleys are no closer than about one foot apart, or until the victim is out of the crevasse. While hauling, mid-person (climber B) keeps an eye on the Bachmann knot to ensure it doesn’t jam in the pulley. Anytime the hauling is paused the load is eased back onto the Bachmann knot by extending it away from the anchor. This should be done when Climber C needs to check the victim Climber A’s proximity to the lip or the system needs to be re-set as the victim is not yet out of the crevasse. The backup figure-eight loop knot is retied and clipped back in before resetting the system. The system is reset by Climber C moving (resetting) the floating pulley prusik back toward the edge of the crevasse (while self-belaying), checks the status of Climber A, then returning to Climber B to resume hauling. This process is repeated until the fallen Climber A is out of the crevasse. 

**Note:** In any rescue scenario, monitor the progress of the victim (Climber A) to avoid pulling the victim into the crevasse lip, causing injury. As the victim approaches the crevasse lip, hauling should cease (pause) so the victim can remove the rope from his/her chest harness and negotiate crossing the lip safely with the assist of the rest of the rope team, if necessary.(There could be an overhanging lip which Climber A needs to chop away with the ice axe).

**Note:** Climber B will assist in pulling on the rope but his/her primary duty is guarding the anchor and tending the Bachmann.

### 2:1 (C)-PULLEY SYSTEM (SINGLE PULLEY) “DOUBLE ROPE” SET UP

This system is used if the fallen climber is conscious and able to help with the rescue and if additional help is on hand (a second rope team) to set the system up and help pull the climber out of the crevasse.

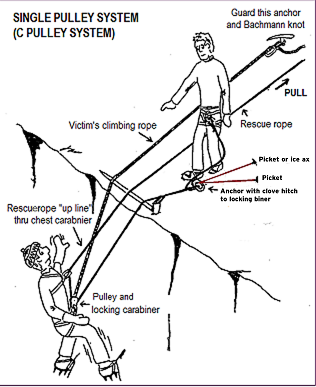
In the description below, rope team one with the fallen Climber A is assisted by a second rope team whose members are identified as 1, 2 & 3.

Rope Team one (A, B, C) completes setting the initial and main anchors as described in steps #1-3 of the crevasse rescue procedure on prior pages.

Depending on the depth of Climber A’s fall, Climber 2 on the rescue rope team may need to retie closer to Climber 3 to allow enough rope to reach fallen Climber A.

Discuss when this would be suitable (victim’s rope entrenched, victim able to assist and another rope team available) and walk students through the procedure. Then set up and practice the single pulley as many times as time allows. Set the initial and back up anchors as in above Z pulley procedure. Have mid-person on victim’s rope (Climber B) guard the anchors and tend the Bachmann knot taking up slack so the victim’s rope to the anchor is always taut. Likewise have the belayer keep the rope taut to victim as he/she is being raised.

This rescue exercise requires two rope teams. Lower the victim into the crevasse on belay. The victim is attached to initial and main anchors tended by Climber B, and also on the belay rope. The second rope team, Rescue rope team (Climbers 1, 2 & 3), practices set up and operation of Single Pulley (C Pulley) and performs the actual rescue.

1. Rescue rope team belays lead climber (Climber 1) to lip of crevasse.
2. Climber 1 sets up an equalized anchor, either using 1.) a picket and ice ax, 2.) two pickets, or 3.) picket and deadman (if snow conditions demand it).  If an ice ax is used as part of the anchor, the sling must be girth-hitch around the shaft (NOT through the hole.) Pickets should be driven in at a 15-20 degree angle from the slope, away from the direction of pull, as near the lip of the crevasse as possible. Climber 1 attaches self to the anchor with a clove hitch on a locking biner.  When tying the clove hitch, allow enough length to stand while tending the anchor.
3. Climber 1 places an ice axe at the lip of crevasse and secures the ice to the anchor they just placed. (**Do not attempt to position the ice axe under the rope to the victim**).
4. Climber 1 then places a pulley and locking carabiner on the bight of rope between his anchor and Climber 2. The pulley, carabiner, and rope are placed over the ice axe and carefully lowered to fallen Climber A. Climber 1 must guard the anchor at the lip from this point forward.
5. Victim (Climber A) clips the locking carabiner attached to the pulley into the loop formed by the figure-8 tie-in knot on his/her seat harness. The victim then clips the “up” rope (the portion of the rope that will be pulled) through his/her chest harness carabiner. He/she signals readiness to be hauled out. Maintain the hauling rope over the ice axe at the lip.
6. Climbers 2, 3 and C haul the rope hand-over-hand at climber 1’s direction. As slack becomes available in the rope between fallen Climber A and Climber B (tending the Main anchor), Climber B pulls the slack through the Bachmann knot. (The safety belayer also continually removes slack in the belay line). As climber A nears the top of the crevasse, Climber 1 stops climbers 2, 3 and C from pulling long enough for Climber A to unclip the rescue rope from the chest harness. (Otherwise he/she would be pulled into the lip of the crevasse). Climber A is then carefully hauled over the lip.

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# FIELD TRIP #7 – HARD SNOW

**Hard Snow Ice Axe Arrest Test and Snow Travel Techniques**

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| **FIELD TRIP #7 HS – HARD SNOW** | |
| **Date/Time:** | Date: Sunday June 7th, 2020  Starting Time: Arrive by 6:30 am and be ready to go by 7:00 am.  Duration: Eight to ten hours |
| **Location:** | *Panorama Point area, Mt Rainier National Park*  *Meet at Paradise upper parking lot, Mt Rainier National Park* |
| **Directions:** | Go East on SR 512 to SR 7. South on SR 7 to SR 706 in Elbe. East on SR 706 through Ashford to the Nisqually Entrance. Pay entrance fee and continue on to Paradise. |
| **Prerequisites:** | * Lectures: 2 and 5 * Field Trips: #1 Prep, #1, #2, and #3 * Pass a conditioner hike (2nd year student must also complete a conditioner in the current year prior to this field trip) |
| **Assignments:** | * Review: *Freedom of the Hills, 9th edition*   Snow Travel and Climbing ……….. Ch 16  Glacier Travel ……………………. Ch 17   * Study: Information contained in this section.   Information required for FT #3 (Soft Snow)   * Practice: Review and practice the navigation fundamentals (Ch 5)   Review and practice the setup of carabiner-ice axe belay.(349-351) |
| **Purpose:** | * **Tested** on ability to use ice axe and arrest on hard snow * Practice crampon techniques * Practice & demonstrate ice axe self-belay * Demonstrate proper safe glissading skill * Practice traveling up & down slope with crampons * Practice rope management as a rope team “on a glacier” * Practice ascending/descending techniques * Practice team arrests * Practice belaying team members in/out of camp or near crevasses * Practice set up and utilization of running belay * **Tested** on ability to use carabiner-ice axe belay * Practice snow anchor construction |

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| **EQUIPMENT**  **See Required Equipment FT 7 on the Equipment Matrix (Lecture 1)** | |
| **Special Notes & Items** | * Map: USGS map “Mt Rainier East” * Drivers need a current ***National Park Pass*** or pay ***Park entrance fee*** * Plan to stay overnight Saturday. We have a group site reserved at Longmire Campground, for both Friday and Saturday nights. * Parking is very limited, so please **maximize** carpools. |

**PROCEDURE**

Arrive at the Paradise Overnight parking lot by 6:30 AM and be ready to go at 7 AM. Have your bags packed for another day out on the glacier. When everyone is ready we will group up. The field trip leader will give you a rundown of the day, hand out field trip books, and organize the groups before we hike in. We will hike in as a group up the trail to the Deadhorse area, and begin the activities for the day.

The objective of this field trip is to demonstrate the snow climbing techniques essential for successful alpine climbing. All testing and practice will likely be done on steeper terrain with harder snow than experienced at Field Trip 3 - the Winter Overnight – these conditions are frequently found on mid to later season Cascade climbs.

You will be tested on your ability to perform the Critical Skill of ice axe arrests, practiced at Field Trip 3 but this time with a pack on in hard snow. Review prior material on the ice axe arrest, keeping in mind that the arrests on hard snow are more difficult than in soft snow.

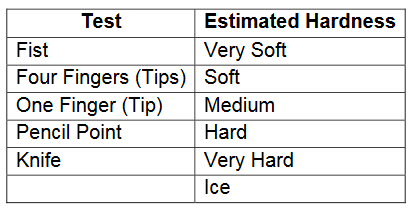
Other skills such as self-belay with your ice axe, roped glacier travel, cramponing, glissading, team arrests, and snow anchors will be covered. **You will be tested on knowledge and ability to perform these skills as well.**

## SNOW ANCHOR AND BELAYS STATION

At this station, you will be building snow anchors and belaying a fellow climber. You should know how to set up each type of anchor or belay, and understand when to use them. You will need to show competency in building the following anchors and belays:

* **Carabiner Ice Axe Belay** - used to provide a top belay to a weak or tired climber whom is ascending or descending a slope and a slip may be more likely. This is not a bomb-proof anchor which would be required if a fall (not slip) is more likely.
* **Running belays** – used when a team need to move quickly or a belay is not necessary. Typically on 4th class rock or steep snow slopes where run out is bad and a slip could be bad or deadly.
* **Snow Bollard** – used typically for emergency rappels when you do not have the right equipment to build an anchor.
* **Pickets:** It is very important to understand how to build picket anchors and to understand when to use each type. Use the following tests to understand the type of picket anchor that should be used with the various snow pack.

**Snow Hardenss Test – This test helps describe the hardness (or compression strength) of the snowpack using your gloved hand for assessment.**

• If the layer is not ice, gently push your fist into the layer. If your fist penetrates the layer easily, it is considered Very Soft. 

• If your fist doesn’t penetrate easily, hold your hand flat and so that the tips of your four fingers are just touching the snow and push gently. If your four fingers penetrate the snow easily, the layer is considered Soft.

• If your four fingers don’t penetrate easily, push gently into the snow with the tip of one finger. If one finger penetrates the snow easily, the layer is considered Medium.

• If one finger doesn’t penetrate easily, gently push the sharpened end of a pencil into the snow. If the pencil penetrates easily, this layer is considered Hard.

• If the pencil doesn’t penetrate easily, gently push the tip of a knife into the snow. If the knife penetrates easily, this layer is considered Very Hard.

**Snow Compression Test (aka Snowball Test)- which helps determine if work hardening (compressing) the snow will make it stronger.**

Try tomake a snowball, the snow:

**Passes –** you can form a solid snowball. This means the snow can be compressed (work hardened) to make a stronger snow anchor.

**Fails**- you cannot form a solid snowball (i.e. the snowball crumbles or will not compress at all, which occurs when the snow is very cold and dry). Do not attempt to compress the snow before building an anchor, it can actually weaken the anchor.

**When to use each type of picket:**

Note: If the snow passes the snowball test. Always compress the snow before building an anchor.

* + Vertical Top Clip Picket- Best in knife hard snow (you have to use your ice axe to hammer the picket in) and a trench cannot be cut into it. If used in anything less the placement is “iffy.” Note that top clips are almost always weaker than mid-clipped pickets but is a good option for knife hard snow since cutting a slot for the attachment sling on mid-clips can be very difficult.
  + Vertical Mid-Clip Picket (Sierra) – either knife hard snow (that can have a slot cut into it) or compressible snow (passes the snowball test). In the latter, make sure to backfill the trench and compress the snow in front of it.
  + Deadman (horizontal mid-clip)- all types:
    - Knife hard snow (that can have a slot cut into it)
    - Compressible snow (passes the snowball test), make sure to backfill the trench & compress it.
    - Weak (soft) snow that cannot be compressed to make it stronger (typically very cold or wet snow). Do not attempt to work harden the snow, it will make it weaker.

## ICE AXE ARREST STATION

At this station, you will be tested on your ability to arrest. You will be expected to perform the skill with little to no hesitation and show proficiency arresting in hard snow. You will get a chance or two at arresting, so if the instructor does not deem the first try sufficient, do not worry you will get another chance (maybe two). You must pass this skill with all S grades in order to pass the field trip. It is likely that this will be your only chance to pass this skill and there will be no retests. Below is a list of the arrests you must perform:

* Feet first, with back on the snow, both with and without a pack
* Head first, with back on the snow, both with and without a pack
* Head first, with stomach on the snow, both with and without a pack
* Feet first, with stomach on the snow, no ice axe, no pack

## GLACIER TRAVEL AND SNOW SKILLS

# During the field trip, we will also continue to practice snow and glacier travel skills, as you did in Field Trip 3. However, the instructors are expecting you to be knowledgeable and able to perform the following skills when asked.

# Seat Harness prusik belay \* Rope management/switch-backing/team communication

# Passing a picket \* Practice using wands

* Kiwi Coil \* Team Arrest

Ascending/Descending Techniques:

* Rest Step \* Traveling in Balance
* Kicking Steps \* Backing down
* Self-belay \* Plunge Step
* Glissading

Crampon Techniques:

* American (combination)
* French (Flat-footing)
* German (Front pointing)

1. Drafted by the Progressive Climbing Education Curriculum Committee 2018 and adopted at the 2018 Mountaineer’s Climb Summit. [↑](#footnote-ref-0)