Basic Mountaineering Course
Student Handbook
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Introduction

Welcome to the Basic Mountaineering Course. We look forward to working with you, to your success in this course, and to a SAFE and ENJOYABLE climbing career for you.

All of the people who operate the course are volunteers. By the time it is over they will have put in hundreds of hours to make the program run smoothly. However there are responsibilities for you also. We feel that you will enjoy the course more if **you**:

- recognize that a high level of fitness is mandatory to complete the climbs and to ensure that you are not a liability to your climbing party
- know that YOU are primarily responsible for your safety and progress in this course
- recognize that a satisfactory level of mountain climbing knowledge and skill performance is required to pass the course
- have a positive attitude and seek additional help and information when needed. Don't be afraid to ask. The people working with the course enjoy helping you
- arrive at the lectures, field trips and climbs **ON TIME**
- are prepared by reading the assignments and having the proper equipment and the knowledge to use it. Be organized.
- are flexible! Many situations which are unplanned have turned out to be valuable learning experiences because students are flexible, patient and alert to the learning possibilities. Sometimes lectures, but particularly field trips, may not run exactly as planned.
- watch the leaders of climbs. Pay attention because they are one of your sources for learning. They have been carefully screened by the Climbing Committee and have extensive climbing experience.
- practice the "leave no trace" philosophy and clean climbing. This means be aware of the fragile alpine environment and act to protect it from harm. If you can answer "no" to the question, "Will others know I have been here?" then you have been a clean climber.
- plan to give something back in the future, such as assisting on field trips for the next year's class. This volunteer spirit is what makes this class a success.

If questions or problems arise during the course please feel free to contact members of the Climbing Committee or the Student Coordinators for the course. We want to hear your comments, both good and bad, as they help us improve the scope and quality of this course.

Lecture Objectives

The lecture series has several objectives:

- to highlight, explain and elaborate on key mountaineering principles and concepts
- to supplement the textbook material
- to provide specific information on upcoming field trips
- to serve as a central meeting time to answer questions, address problems, clarify policies and procedures, etc.

The text for the climbing course is ***Mountaineering: The Freedom of the Hills***, most recent edition, written and published by the Mountaineers. ***You must read the required chapters before each lecture***.

Lectures are planned to begin promptly at **7:00 pm**, unless noted otherwise. Arrive a few minutes early so you have time to chat with fellow students and the instructors, and to find your seat.

Field Trip Objectives

Field trips offer you the chance to practice, under a qualified instructor, the material presented in the lectures and in the text. Field trips are where you learn to develop your climbing skills. Therefore it is important that you come prepared. The adage that you get out of something what you put into it certainly applies to this course. Your instructors will not make you into a climber; YOU will make yourself into one with their help. Review lecture and text material before each field trip. To get the most out of a field trip, PRACTICE THE MATERIAL BEFOREHAND on your own. At the field trip, work to challenge yourself. You can always do more than you think you can.

Each field trip must cover a great deal of material in a very limited time. It is often difficult to train such a large class safely without becoming too impersonal. You can help by keeping in mind the following:

- PREPARE FOR EACH FIELD TRIP. Review all materials and handouts, and practice beforehand. This will guarantee developing your climbing skills as quickly as possible.

- be prepared for full, long days at each practice. Get sufficient sleep the night before, and don't plan a big night when you return home

- do not bring family, friends, or pets to the field trips

- arrive early enough to park and make whatever preparations are necessary so that you are ready to begin at the starting time

- stay with your group, and don’t wander out of the area

- Please remember that your instructors and leaders are all volunteers. All have something to teach you and deserve your attention and courtesy.

Missed Activities

Missed lectures and field trips are nearly impossible to make up. Because attendance at lectures and field trips is essential for continuation in the course and for graduation, students must plan accordingly. **IT IS YOUR RESPONSIBILITY TO BE PRESENT AT ALL ACTIVITIES**. Contact the student coordinator(s) early if you think you may miss a Bellingham class activity.

Trail Work / Stewardship Requirement

The Mountaineers, founded in 1906, have long demonstrated a tradition of commitment to wilderness conservation and minimal impact practices. This tradition has broadened in scope and action over the years, but remains one of the core functions of The Mountaineers.

Therefore, the Bellingham Branch requires all students in the Basic Mountaineering and Scrambling Courses to "give back" at least one day of outdoor trail work. Students have found many personal rewards from this, including:

- introduction to a new area
- protection of the wilderness through proper trail construction and maintenance
- increased comfort and efficiency in backcountry travel
- pleasure and pride during trail use on later trips
- shared enjoyment of contributing with other students and volunteers
- increased appreciation for the magnitude of labor and expense for trail upkeep

Some students new to this activity have found it so enjoyable that they have become involved in multiple projects. In fact, many have made conservation volunteering a new facet of their outdoor experience.

You will have opportunities to participate in conservation activities during the course through The Mountaineers, Volunteers for Outdoor Washington, or Washington Trails Association.

Climbing Graduation Requirements

To be eligible for the "Basic Course Certificate," the student must complete the following within the year of registration:

- attend all of the required lectures and practice sessions and **pass the written exam**
- satisfactorily complete each of the required field trips
- reach the summit and complete in a competent manner three **Basic Climbs**, including at least one **Rock (BR)** and one **Glacier (BG)** climb
- complete a **Alpine First Aid** (or equivalent) training class
- participate in an approved backcountry stewardship activity, such as trail maintenance
- apply for graduation by the date listed on your graduation application form
- overall competency to the level that any leader will climb with you

Student Responsibilities

1. Be realistic in your choice of climbs – Basic Climbs vary in difficulty and strenuousness.
2. Basic Experience Climbs are not field trips. Review the skills that will be needed for the climb prior to leaving home. For climbs practice tying knots, belaying, and setting up to rappel before the climb.
3. Be sure to bring the equipment that the leader requires even if not part of the standard list for that type of climb (e.g. an ice axe and crampons for a rock climb). If unsure, call the leader to confirm the need and understand the conditions that require the equipment.
4. Be sure to leave trip details (including planned summit and route, trail head location, expected return time, time when overdue, leader name and phone number, and other Mountaineers to call if leader does not answer) with a responsible contact person.
5. Remember that you are part of a Mountaineers team and are not being "guided" to the summit. Do what you can to help the team succeed.

A Standard of Judgment – The Climbing Code

> Climb if you will, but remember that courage and strength are naught without prudence, and that a momentary negligence may destroy the happiness of a lifetime. Do nothing in haste; look well to each step; and from the beginning think what may be the end.
>
> – Edward Whymper

All Mountaineer sponsored climbs must adhere to **The Climbing Code**:

- A climbing party of three is the minimum, unless adequate prearranged support is available. On crevassed glaciers, a minimum of two rope teams is recommended.
- Rope up on all exposed places and for all glacier travel. Anchor all belays.
- Keep the party together, and obey the leader or majority rule.
- Never climb beyond your ability and knowledge.
- Never let judgment be overruled by desire when choosing the route or deciding whether to turn back.
- Carry the necessary clothing, food and equipment at all times.
- Leave the trip itinerary with a responsible person.
- Follow the precepts of sound mountaineering as set forth in textbooks of recognized merit.
- Behave at all times in a manner that reflects favorably upon mountaineering and The Mountaineers with minimum impact to the environment.

Basic Experience Climbs

The purpose of BASIC climbing and scrambling is for you to experience what you have learned in the Lectures and Field Trips. Your field trip experiences take on new dimensions when you face them in the mountains. The climbs are chosen to enable you to gain experience, have fun and learn more about your abilities and the mountains.

Basic experience climbs will be scheduled generally from May through September. To graduate from the Climbing Course you must successfully complete (i.e. reach the summit and return to the trailhead) in a safe and competent manner three scheduled Basic Experience Climbs. One must be a rock climb (designated BR), one must be a basic glacier climb (BG), and the third may be a basic alpine (BA), glacier, or rock climb. We recommend and encourage you to complete an alpine climb as it allows you to use a variety of skills. The terrain may involve a little rock climbing, some scrambling, and even some glacier travel all within the same trip.

Students may participate on basic climbs or scrambles with *any* branch. The club's climb and scramble schedule for all branches is available on the web (www.mountaineers.org). The climbing website also contains reference information on specific climbs, as well as other useful material.

You should start your climbing early in the season as the changing weather and mountain conditions may make it difficult to successfully complete the three required trips. Plan to go on more than three climbs to help assure you don't get "weathered out" or otherwise aren't able to summit on one or more of them.

Climbers are expected to be in good physical condition before participating on trips. All climbs and scrambles are not suited for all climbers or scramblers. You should consult guidebooks (Beckey's Alpine Guides, etc.), maps, and knowledgeable persons to determine what climbs or scrambles are within your capabilities. Talking to the leader before signing up is encouraged.

Reporting An Overdue Climber

Climbs are often long and strenuous, take place on Mother Nature's terms, and are carried out with safety as the foremost concern. As a result, some trips are late in returning to the cars or arriving home. Occasionally, climbers must bivouac an additional night and not return until the following day. For this reason, it is important that relatives or close friends advised of your activities do not overreact to your tardiness. DO NOT promise to return by a certain time - spouses, parents, and others have been known to panic if you have not returned by then.

Climb leaders have been chosen for their technical ability, reliability and leadership qualities. They have the ability to perform and assist with proper first aid procedures and mountain rescue. They pre-designate someone at home to notify the Climbing Committee Chair in case the party is late returning. This initiates the proper rescue procedures. Should this become necessary, or should help be requested by persons who have been sent out by a climbing party, families of the party will be notified.

IN NO CASE SHOULD RESCUE AUTHORITIES BE DIRECTLY CONTACTED. Instead, if a climber has not contacted home after a scheduled Basic Course Climb by NOON on the day following the climb, relatives and friends of the climber should attempt to reach the following individuals in the order listed until successful contact is made and the person acknowledges that they will pursue the matter and advise the proper authorities.

Position (see front page for contact info)

1. Trip Leader
2. Climbing Committee Chair
3. Bellingham Branch Chair

Please be assured that there are always enough people monitoring the course trips and activities that, should rescue personnel be required, the student’s family will not be required to initiate the rescue process.

Fill in the trip leader's name and phone number and leave a copy of the form on the next page with the person who expects you to come home before each climb. Discuss this procedure with your spouse, relative or friend prior to going on field trips and climbs.

Climb Itinerary To Be Left With A Responsible Person

Date and Departure Time	
Date and Estimated Time of Return	
Climb Leader(s) and Phone Number(s)	
Climb Participants and Phone Numbers	
Trailhead, Vehicle Make, Model, License Number	
Climb and Route Description	

What to do in case a climber is overdue

Climbs are often long and take place on Nature's terms with safety as the foremost concern. As a result, some trips are late in returning to the trailhead. Occasionally climbers bivouac an additional night and return the following day. **Climb parties are not considered late unless they have not contacted home by *noon* of the day following the return date specified above.**

In no case should rescue authorities be contacted directly. Instead relatives and friends should attempt to reach the following individuals, in the order listed, until successful contact is made and the person acknowledges that they will pursue the matter and advise the proper authorities.

Contact List: 1. Trip Leader (see contact information on first page).
2. Climbing Committee Chair
3. Branch Chair

Photocopy this page so you have copies to fill out for all your Mountaineers climbs.

Physical Conditioning

> It would puzzle a materialist to explain how frequently the reward of beauty is associated with the discipline of toil, as if nature consciously reserves her noblest effects for those who take some trouble to earn them.
>
> - Arnold Lunn.

Conditioning is essential to safe and successful mountaineering. You should be prepared to carry a 30-pound day pack 10 miles in a day, with a 4000 foot elevation gain; or carry a 45-pound overnight pack six miles in a day with a 2500 - 3000 foot elevation gain. You don't have to be a track star or have superhuman strength or endurance for the course but should, nevertheless, be in good condition. Otherwise you may be unable to keep up with the party, slow down the party enough to cause the summit not to be reached, or cause delays that will jeopardize the safety of the party. Also, inadequate conditioning will contribute to a loss of alertness and inability to respond to the demands of the environment, jeopardizing your safety and that of the party. In addition, if you are in shape, you will get far more enjoyment out of the field trips and climbs.

If you have any medical condition that might limit your activity level, you should clear your involvement with your doctor and inform the trip leader of your situation.

The course will start to become more strenuous by the first snow field trip so start conditioning yourself now. The following is a recommended approach to obtain the required conditioning:

- begin now a consistent program of aerobic conditioning of a minimum of 30 minutes, 3 times a week. This can be jogging, bicycling, aerobic dancing, etc. Running stairs or running uphill is particularly beneficial (if your body can stand it).
- try to get into the mountains frequently to hike, snowshoe, or ski
- in the spring, try to take short hikes with substantial elevation gain such as Chuckanut Mountain. These hikes will get you started and can be done in almost all seasons and any weather. See Ken Wilcox's *Hiking Whatcom County* (Northwest Wild Books, 2003) for details:
  - **Pine & Cedar Lakes**, 4-6 mi. RT, 1300-1600 ft gain, 2-5 hrs
  - **Fragrance Lake**, 2-5 mi RT, 100-1800 ft gain, 2-4 hrs
  - **Oyster Dome & South Chuckanut Mountain**, 5-6 mi RT, 1600-2000 ft gain, 3-5 hrs
  - **Lily & Lizard Lakes**, 8-11 mi RT, 1000-2000 ft gain, 4-8 hrs
- consider developing some upper body strength and muscle tone through weight lifting, push-ups, pull-ups, aerobic dancing or calisthenics. Hand strength can be developed by squeezing a rubber ball or hand grip. This will dramatically improve your rock climbing ability and enjoyment.

Club Standards

All members of the Mountaineers, in order to attain the Club's purposes ...”to explore, study, preserve and enjoy the natural beauty of Northwest America”... in spirit of good fellowship shall subscribe to the following:

- to exercise personal responsibility and to conduct themselves on Club activities and premises in a manner that will not impair the safety of the party, or prevent the collective participation and enjoyment of others

- Private property must be respected.

- to enter the outdoors as visitor, leaving behind no debris, environmental scars, or other indications of their visit which reduce the enjoyment of those who follow

- to minimize the environmental impact on the outdoors by using campfires only in properly designated areas and extinguishing completely after use; preventing sources of pollution (i.e. human waste) from reaching watercourses; and carrying out all garbage

- The use of alcohol and other recreational drugs is incompatible with Mountaineer activities because of their effects on ability and judgment; their use is prohibited when such use would affect the safety of the party or impair the collective participation and enjoyment of others.

- Pets, firearms, or any other items which will impair the safety or enjoyment of others shall not be brought on Mountaineer premises or taken on club activities.

- to obey those specific regulations imposed by the Board of Trustees, Branches and Divisions of The Mountaineers, which are necessary to implement the above

Those Mountaineer members who deviate from this philosophy and from the specific Club regulations may be subject to the disciplinary procedures of the Club, including expulsion.

Information Resources

These organizations can share important information about the mountains, trails, climbs and weather.

Route and Trail Information

Mountaineers Reference Pages: ..... www.mountaineers.org/seattle/climbing/
Washington Trails Association: .....www.wta.org
Climber's Discussion Forums: .....www.cascadeclimbers.com

Avalanche/Mountain Weather Forecast 206-526-6677
Cascades & Olympics: .....www.nwac.us/
Cascades & Mt. Hood: ..... www.pnwsnow.com
British Columbia: ..... www.avalanche.ca

Weather

Cascades & Olympics: ……..……www.wrh.noaa.gov/sew/forecast03.php
Cascades & Olympics: ……www.wowweather.com
British Columbia: ……www.weatheroffice.ec.gc.ca/forecast/canada/bc_e.html

Washington Highway Pass Info 1-888-766-4636
www.wsdot.wa.gov/traffic/default.aspx

North Cascades NP, Ross Lake NRA, Lake Chelan NRA

Marblemount 360-873-4590
www.nps.gov/noca

Mt. Baker-Snoqualmie NF

Mt. Baker Ranger District, Sedro Woolley 360-856-5700
Glacier Public Service Center, Glacier 360-599-2714
www.fs.fed.us/r6/mbs

Washington State Parks

Region 2 office, 220 N Walnut, Burlington 360-755-9231
www.parks.wa.gov

Washington Department of Natural Resources 800-527-3305
Northwest Region, 919 North Township, Sedro Woolley 360-856-3500
www.dnr.wa.gov/

The following are emergency contacts only, not for information:

Whatcom County Sheriff..... 360-384-5360 *or* 911

Skagit County Sheriff ..... 360-336-9450 *or* 911

Introduction and Leave No Trace Lecture:

Objectives

- Meet one another
- Review Leave no Trace Ethics
- Preview course
- Understand requirements and answer questions

Outline

- Introductions
- Leave No Trace (LNT)
- General Course Guidelines
- Overview of Field Trips and Lectures

Additional Resources:

Freedom of the Hills (8e) , Chapter 7
Leave No Trace: Outdoor Skills & Ethics, Pacific NW Volume, by the National Outdoor Leadership School.
`www.lnt.org` for general information

Environmental Concerns And Guidelines — LNT

As climbers we need to understand our potential impact on the wild lands we use for recreation. Without proper care for these lands and the responsible attitudes that go hand in hand, we may lose our access to many places; access which we have always taken for granted. If we fail to demonstrate levels of stewardship sufficient to keep wilderness in a pristine state, then land management agencies will increasingly restrict our use of those lands. The agencies are committed to this response.

As the Northwest's largest outdoor activity club, The Mountaineers has always taken a strong stand on wilderness resource conservation. Our membership is not facing a change in philosophy. What is changing are the techniques and current thinking about the best ways to effect a LEAVE NO TRACE ethic.

LEAVE NO TRACE—One must travel and camp with care, deliberately planning and guiding one's actions, so as not to harm the environment or disturb others.

Seven Basic Principles of Low Impact Recreation

1. In popular places, concentrate use and impact.
2. In pristine places, disperse use and impact.
3. Stay off places that are lightly impacted or just beginning to show effects.
4. Minimize noise and visual intrusion.
5. Pack out everything you brought with you.
6. Properly dispose of anything that cannot be packed out.
7. Leave things as they were or in better condition.

Please refer to *Leave No Trace: Outdoor Skills & Ethics* Pacific Northwest volume by the National Outdoor Leadership School, and Chapters 7-8 of *Mountaineering: The Freedom of the Hills*, Most Current Edition.

Alpine First Aid (A.F.A.)

Required Equipment: Books and supplemental written materials will be provided on the first dayof class.
Also bring:
Day Pack, with whatever Ten Essential Systems you have already
Ice Ax and/or ski poles; and a sit pad/sleeping pad, if you own them
Clothing for cold and wet weather
Lunch and water (see below)

This class is a mix of lecture/discussion and practices/scenarios. On both days, class will start promptly at 8:00. We'll have a couple of short breaks and then break for an hour for lunch at about noon. If students need a change of scenery, they will have time to drive into Blaine for lunch. Class will resume each day at 1:00 pm and run until 6:00 pm.

Objectives:

- Primary and Secondary Survey
- Soft Tissue Injury Treatment
- Muscle, Bone, and Joint Injury Treatment and Prevention
- Treatment and Prevention of Heat and Cold Related Injuries
- Individual Conditioning
- High Altitude Illness Treatment and Prevention
- Ten Essential Systems and Improvisation of First Aid Supplies
- Backcountry First Aid Kits
- Backcountry Hydration and Nutrition
- Small Party Accident Response, Evacuation Considerations, and When to Go For Help

Successful completion of the course will earn each student an Emergency Care and Safety Institute Alpine First Aid Card, which will be current for two years.

Equipment Lecture:

Required reading: ***Freedom of the Hills*** (8e), Chapters 2 & 3

Optional Equipment: Bring any gear that you want to discuss with instructors after the presentation.

Objectives

- Become familiar with the clothing and equipment needed for alpine climbing
- Begin to use the concept of "systems thinking" for your gear
- Learn how and when to acquire equipment
- Start thinking about how to plan for field trips and climbs

Outline

1. Buying Gear
2. Ten Essentials
3. Clothing
4. Boots
5. Packs
6. Camp Gear
7. Technical Gear
8. Trip Planning

Additional Resources:

- *The Mountaineering Handbook*, by Craig Connelly © 2005 by Ragged Mountain Press / McGraw-Hill (Ch. 17 & 18)
- *Extreme Alpinism: Climbing Light, Fast, and High*) by Mark F. Twight (Author), James Martin (Collaborator), Don Graydon (Editor), Mountaineers Books; 1st edition, 1999 (Ch. 7)
- *Backcountry Skiing: Skills for Ski Touring and Ski Mountaineering* (Mountaineers Outdoor Expert Series) by Martin Volken, Scott Schell, Margaret Wheeler. Mountaineers Books, 2007 (pp. 51-62)
- *Alpine Climbing: Techniques to Take You Higher* by Mark Houston and Kathy Cosley. Mountaineers Books, 2004 (pp. 80-102)
- *The Illustrated Guide to Glacier Travel & Crevasse Rescue* by Andy Tyson. Climbing Magazine, 2000. (pp. 17-38)

Additional Equipment Information

Each person is responsible for providing their own equipment. If you have an outdoor background, you probably already own many of the necessary clothing and hiking related items. Some items can be rented. Certain equipment, such as tents and stoves, can and should be shared with another climber. The required equipment varies with the type and duration of the trip. The **Required Equipment Matrix** (pages 71-72) has evolved from the concept of being fully prepared for the most severe weather conditions, unplanned emergencies, and accidents which may cause serious delay, possible injury, and other hardships.

The basis for the list is the **TEN ESSENTIAL SYSTEMS**:

1. First Aid Supplies and Knowledge
2. Insulation - extra clothing and sit pad
3. Hydration - sufficient to maintain two liters of urinary output per day
4. Illumination - headlamp and extra bulb/batteries
5. Navigation - compass and map are required; altimeter and GPS are optional
6. Sun Protection - high SPF for skin, nose and lips, eye protection
7. Nutrition - extra food beyond that needed for the trip
8. Repair Kit and Tools - a whistle should go in here, too
9. Emergency Shelter - as light and compact as possible
10. Fire - fire starter material and water/wind proof flame

These essentials should be carried by all persons traveling in the back-country, whether on an extended backpacking adventure or out for a short afternoon's hike. All persons in a group must carry their own Ten Essential Systems - if a person is separated from the rest of the party the equipment in someone else's pack will be of no use to the separated member!

The club provides ropes for all climbing field trips and many club climbs. Sometimes, the climb leader and the rope leaders provide ropes. Basic Course students are NOT required to buy ropes. However, you might wish to purchase a rope later in the season after you are certain of your climbing interest.

The equipment detailed in this handout is not all needed at the beginning of the course. You may begin with the basics and slowly acquire the rest. Some items may be rented or borrowed rather than purchased. These include boots, gaiters, crampons, ice axe, helmet, pack, tent, and stove. **The Required Equipment Matrix** shows what equipment is needed for each activity.

Lightweight Philosophy

Go Lightweight! Technical equipment required for some climbs can add 10-25 lb to the weight of each climber's pack. For reasons of safety and comfort, learn to evaluate gear based on weight in addition to function.

Consider some of the following reasons to minimize pack weight:

1) When climbing, speed often equates to safety, such as when trying to beat an approaching storm or darkness. Also, crossing glaciers or avalanche terrain as quickly as possible helps minimize dangers associated with snow instability.

2) The weight of the stuff you wear and carry on a trip matters: more weight means greater fatigue, diminished balance, and possibly a longer time to get there and back. Fatigue, diminished balance, and taking a long time increase the risk of accidents. But leaving a safety-related item behind to reduce weight also creates risks. So you are always faced with trade-offs. Take the trade-offs seriously by, first, remembering that the weight of an item you may want to buy is a significant property when considering alternatives, and, second, by asking hard questions when putting your pack together: Does this optional item really buy me anything? Do I really need this heavier garment or is the lighter one enough?

3) Lightweight gear often enhances safety, not diminishes it, because it is more likely to be taken along (e.g. a light helmet). Safety needn't be compromised by choosing lightweight equipment. A 15-20 oz ice axe can be just as functional for basic climbing as a 36 oz axe. There are some exceptions to this: certain aluminum crampons are not suitable for steep ice or for mixed ice/rock conditions. Ask advice of fellow climbers and instructors.

4) Your individual decisions affect the whole climbing party. No one wishes to be the slowest member of the group.

Minimizing pack weight is vital. From a bio-mechanical standpoint the maximum percentage of body weight which can be carried and sustained is about 30-35% for men and 25-30% for women. That means that a 160 lb man can haul a pack of about 50 lb, and a 135 lb woman can haul 40 lb. Of course, individual fitness and tenacity can alter this rule-of-thumb. Nonetheless, individual gear should be selected and group gear should be distributed with this rule in mind.

Tips for minimizing pack weight:

1) Justify every extra item which goes into your pack.
2) Share group items efficiently (e.g. tent parts, water filter, stove, pot, first-aid kit). A group of three persons sharing camping items is the most weight efficient.
3) Distribute group gear according to ability to carry.
4) Use quick-cook foods

Consider the following table which compares the minimum and maximum weight of selected items from an overnight pack with gear for a glacier climb.

Backpacking Gear	**Minimum Wt. (lb)**	**Maximum Wt. (lb)**
Pack	3	8
tent (2-person)	5.5	9.5
Pad	1	2
sleeping bag	1	3.5
clothing (raingear, etc.)	3.5	6.0
comforts (camp shoes, etc.)	0	2
cooking kit (stove, pot(s), etc.)	2	6
Subtotal	**19.5**	**37**
Technical Gear		
ice axe	0.9	2.3
crampons	1.2	2.4
harness	0.6	1.7
helmet	0.6	1.4
Subtotal	**3.6**	**7.8**

From the above table it is clear that the greatest opportunity for weight savings comes from carefully selecting lightweight backpacking gear; some gear weighs twice as much but gains you little in functionality. Although technical climbing equipment contributes less than backpacking equipment to the overall weight of an overnight pack, the added weight is still very significant. This is especially true when you consider that on the summit day, when you are climbing the most difficult terrain, your day pack will contain all of your technical gear.

Local Sources of Equipment

Shop Bellingham first!

Backcountry Essentials 214 W. Holly, Bellingham	360-543-5678	REI 400 36th St., Bellingham	360-647-8955
American Alpine Institute 1513-A 12th St., Bellingham	360-671-1505		

Shopping in surrounding cities

Second Ascent 509 Ballard Way NW, Seattle	206- 545-8810	Pro Mountain Sports 5625 University Way, Seattle	206-522-1267
Mountain Equipment Co-op 130 West Broadway, Vancouver	604-872-7858 800-663-2667	Marmot Mountain Works 827 Bellevue Way NE, Bellevue	800-600-1044
Feathered Friends 119 Yale Ave. N, Seattle	425-453-1515 800-254-6246		

Local Places that Repair Gear

The Gear Doctor: repairs backpacks, bags, tents, clothes and more
Michael K. McKenna, 360-961-GEAR, TheGearDoctor@gmail.com, www.thegeardoc.com

Rainey Pass Repair
4415 Stone Way North, Seattle, WA 98108, 888-747-7867 or 206-523-8135

Mail Order Cobblers

Dave Page, Cobbler
3509 Evanston Avenue North, Seattle, WA 98103, 206-632-8686

Cascade Cobbler
22 Trillium Rd Winthrop, Washington 98862 shoe@cascadecobbler.com 509-996-2166

Great Online Deals

eddiebauer.com (First Ascent)
gearx.com
gearexpress.com
backcountry.com
backcountrygear.com
steepandcheap.com
froogle.com
reioutlet.com
sierratradingpost.com
omcgear.com

Note: We recommend that you do not purchase equipment until after the equipment lecture. Special discount packages are sometimes offered by several suppliers and these are announced at the first lecture.

Compasses – What to Look For

A compass to be used for wilderness travel must have a number of essential features:

- a transparent, rectangular base plate
- a direction-of-travel line or arrow parallel to the edge of the base plate
- an index line or mark on the base plate, at which bearings can be read
- a rotating dial with transparent base
- angle graduations marked on the dial in increments of 2deg in a clockwise direction
- an orienting arrow and parallel meridian lines marked on the rotating base
- a liquid-damped magnetic needle

Extra features, such as sighting mirrors, are helpful but not required. Adjustable declination offset makes the compass much easier to use in the field and is highly recommended. If you don't already own a decent compass, buy one with adjustable declination. A clinometer makes a compass even more useful.

Climbing Helmets – What to Look For

A hard hat to protect a climber's head is a compromise between some crucial and some desirable features. Personal preference is an important consideration; a helmet you won't wear is of no use.

When selecting a helmet, consider the following characteristics:

- protection from impact on top of head (rockfall)

- protection to side of head (tumbling fall/rappel pendulum)
- upward visibility not impeded by brim
- ventilation
- wearable with or without warm hat
- comfort to wearer (try the chin strap and buckle)
- should not impair hearing
- only helmets specifically designed for climbing are acceptable. Bicycle helmets are designed to satisfy different specifications and are therefore ***not*** acceptable. Any UIAA approved climbing helmet is acceptable. You cannot go far wrong by selecting from the following brands: Salewa, Petzl, Camp, Black Diamond, or Edelrid.

Runners - What Lengths to Get

Each student must purchase runners cut by the store clerk into exact lengths at the time of purchase with an electric rope cutter, which prevents them from unraveling.

You will need a total of seven runners made from 1-inch tubular nylon webbing of the following lengths:

- One 9'6" runner of one color (for chest harness),
- Two 9'0" runners of a second color (double runners),
- Four 5'6" runners of a third color (single runners)

Prusik Cords - What Lengths to Get

You will need a foot prusik and a waist prusik of one color and two tie-off loops of a different color. These should be made from 6mm Perlon (not Kevlar). See the chart below for the appropriate lengths depending on your height.

Student Height	Foot Prusik	2 Tie-off loops	Waist Prusik	Autoblock
less than 5'2"	13'0"	4' 0"	5'0"	6' 0"
5'2"-5'7"	13'0"	4' 0"	5'6"	6' 0"
5'8"-6'1"	13'0"	4' 0"	6'0"	6' 0"
6'1"-6'6"	13'0"	4' 0"	6'6"	6' 0"

Personal Anchor/Tether

You will need a personal anchor/tether. You have the following three options.

- 9' Long tubular webbing
- P.A.S. (Metolius)
- Daisy Chain (Use with knowledge/caution)

When and How to Acquire Gear

(see Equipment Matrix on pages 71-72 of the course manual for additional information what equipment you'll need on each trip)

Don't Buy Unless You're Sure You'll Use Regularly: Rent or Borrow

- Shovel – the club has a number of these
- Beacon – the WWU outdoor center rents these and the club has some you can borrow
- Probe

Ropes & Knots Lecture	Navigation	Fundamentals	Avy	Rock I	Snow I
Harness	Compass	Overnight pack	Warm boots		Ice axe
Webbing, cord, prusiks		Helmet	Clothing	Chock pick	Pulleys
Belay device		Sleeping bag, pad, tent, stove	Gaiters		
Tether		Belay gloves	Goggles/glasses		
Biners		Water purification/storage	Thermos		

- Rock shoes – you can rent these at REI and elsewhere
- Plastic Boots – you can rent various types at the WWU Outdoor Center, AAI, and REI; try various pairs before you buy so you know what type you like and what works well for your foot type and mountaineering needs.
- Crampons – you can rent these as well
- Pickets – may borrow from the club

Key Considerations in Buying Gear

- *Does this gear have the functionality I'll want in the mountains?*
- *Does it function well as a part of the rest of my gear system? Do I have another piece of gear that would do the same thing just as well?*
- *Is this gear useful in various situations? Could I find another product that would be more adaptable/versatile?*
- *How well will this gear hold up over the long run? Is the gear heavier than I'll want making the fact that it holds up less valuable?*
- *Does this gear fit me really well?*

Avalanche Awareness Lecture:

Required Reading: *Snow Sense* (Jill Fredston and Doug Fesler),
Freedom of the Hills (8e) – pp. 356-374

Pre-Lecture Assignment: Take-home Quiz

Objectives:

- Identify avalanche terrain
- Identify basic grain types, weak layers, and strong layers
- Perform field tests to determine snowpack stability / instability
- Recognize weather and terrain factors contributing to stability / instability
- Apply safe travel techniques
- Perform rescue through fast and efficient transceiver use

Outline:

1. Avalanche Phenomenon
2. Terrain Analysis
3. Snowpack
4. Weather
5. Stability Evaluation
6. Human Factors and Risk Assessment
7. Decision Making
8. Beacons / Transceivers
9. Rescue

Additional Resources:

- *Allen & Mike's Avalanche Book: A guide to staying safe in avalanche terrain*, (Allen O'Bannon & Mike Clelland), 2012, Falcon Guides.
- *Avalanche Safety for Skiers and Climbers* (Tony Daffern)
- *Staying Alive in Avalanche Terrain* (Bruce Tremper)
- *Avalanche Handbook* (David McClung and Peter Schaerer)
- *ABC's of Avalanche Safety* (Sue A. Ferguson and Ed LaChapelle)
- *In the Path of an Avalanche* (Vivien Bowers)

Avalanche Awareness Quiz

Name

Terminology. Familiarize yourself with the following terms:

Avalanche path
Release (starting) zone
Track
Deposition zone
Sluffs
Bed surface
Fracture line
Crown
Flank
Weak layer
Triggers

Name the four major types of avalanches.

The interaction of several critical variables must be assessed when evaluating the potential avalanche hazard. Name these four variables.

In the North Cascades and other maritime climates, at what angle of terrain do most avalanches occur?

How does the slope aspect or orientation contribute to avalanche danger?

In a shallow snowpack, how can the terrain act to stabilize the slope? How does this change in a deeper snowpack?

Slopes shapes can be convex, planar or concave. Where are slab avalanches most likely to fail?

In addition to the terrain you are on, it is important to evaluate the terrain above and below you. Describe the hazards you need to be on the lookout for.

You are evaluating a slope as a potential route. You note that unlike the adjoining terrain, this slope is sparsely forested. The trees that are present are small, and many are missing branches on the uphill side. What might this indicate?

The avalanche danger, according to the NW Weather and Avalanche Center, is moderate below 7000 feet but considerable above 7000 feet. Why would the danger vary significantly with changes in elevation?

A snowpack often is composed of strong and weak layers. Does the presence of a strong layer indicate a stable snowpack?

What type of conditions in the snowpack might contribute to the potential for a slab avalanche release?

Snow metamorphism refers to the changes that take place in the snowpack over time. Describe the conditions in which each of the following types of metamorphism would take place and the significance of finding these forms.

1. Rounds/Equilibrium Form

2. Facets/Kinetic Growth Form

3. Wet Grains/ Melt-Freeze

The stability of a snowpack depends on the critical balance between the strength of the snowpack and the stresses exerted on it. What factors would increase the stress? Decrease the strength?

As you are traveling along a snow-covered slope, it is imperative that you are constantly looking for clues that will allow you to determine the stability of the snowpack. What would be the **most** obvious evidence that a avalanche hazard exists? What other visual and auditory clues would suggest danger?

There are several methods that can be utilized to help you to evaluate snowpack stability. Describe each of the following tests:

1. Ski Pole Test

2. Snow Pit Test

3. Shovel/Ski Shear Test

4. Rutschblock Test

Which tests can you use to identify the strong and weak layers found in the snowpack? Which tests help you to determine the strength between these layers?

Weather plays a vital role in avalanches by affecting the critical balance between stress and strength. Describe how these variables affect this balance:

1. Precipitation

2. Wind

3. Temperature

The "Human Factor" is considered an important variable in avalanche accidents. Describe 3 scenarios where human factors can put a party at risk.

It's a gorgeous, sunny day following that long awaited dump of fresh snow. Your party is anxious to take advantage of the clear weather to summit. You are all strong, experienced climbers and each member is equipped shovels, probes and avalanche transceivers. Your route initially follows a ridge but then you must cross sparsely forested, 35 degree, leeward slope .There is about 20" of fresh snow on the top of old crust. How would you evaluate these conditions using avalanche hazard evaluation checklist? What could you do to aid your decision ? What facts would have to be there, on same terrain, to change your mind?

When planning a climb, what preparation can you do at home to minimize your danger of avalanches?

Once you are on the climb, what safe travel procedures can minimize your danger of avalanches?

If you are caught in an avalanche, name some things you can do to help increase your chances of survival.

Avalanche Awareness
Field Trip:

Required Equipment: Clothing for Winter Travel
Snow Shoes or Backcountry Skis (with skins)
Shovel / Beacon / Probe*
Daypack
Food / Water
10 Essential Systems

Outline:

1. Avalanche Phenomenon
2. Terrain Analysis
3. Snowpack
4. Weather
5. Stability Evaluation
6. Human Factors and Risk Assessment
7. Decision Making
8. Beacons / Transceivers
9. Rescue

* bring these items if at all possible – the branch has a few of each available if you do not own or cannot rent these

Field Trip Tips

- **Boots**: You want boots you can stand around in snow without getting cold. Rent plastics or mountaineering boots. Don't wear anything that's not waterproof.
- **Clothing** (layer system): Wear clothing that allows you to stay warm while you're working at various stations (rather than hiking).
- **Food**: Make sure your food is accessible because you'll be eating on the fly.
- Don't forget your sit-pad! You'll want a small piece of foam to sit/stand on.

Navigation Lectures:

Required Reading: ***Freedom of the Hills (8e)*** , Chapters 5-6

Required Equipment: Compass with base plate
Soft pencil and eraser
Footgear suitable for wet/marshy grass
Clothing for outdoor activity in any weather
Headlamp
Clipboard (optional, but handy)

Navigation Lecture/Practice I

Objectives:

- Reading map
- Topo Features
- Long & Lat, & UTM
- Declination
- Compass use
- Other navigation tools (altimeter and GPS)

Outline:

1. Lecture
2. Flat field bearing-taking exercise

Navigation Lecture/Practice II

Outline:

1. Lecture
2. Flat field flag-to-flag navigation exercise

Recommended Maps:

GT = Green Trails
USGS = United States Geological Survey 7.5 minute Quadrangles

- USGS - Bellingham South (required, supplied with Navigation Lecture)
- GT - # 14 Mt. Shuksan (required, supplied with Navigation Lecture)
- GT - # 13s Mt. Baker Wilderness Climbing (required)
- Chuckanut Recreation Area Map (Square One Maps http://www.squareonemaps.com/)
- GT - # 80 Cascade Pass
  and/or
- USGS - Cascade Pass
- GT - # 48 Diablo Dam
- GT - # 50 Washington Pass
- GT - # 209s The Enchantments
  and/or
- USGS - Enchantments
- USGS – Mt. Stuart
- GT - # 207 Snoqualmie Pass
  and/or
- USGS - Snoqualmie Pass
- GT - # 269s Mt. Rainier Wonderland

Rope Handling and Knots
Lecture:

Required Reading: ***Freedom of the Hills*** (8e): Chapters 9-11, pp.379-381

Pre-Lecture Assignment: Learn to tie the knots and hitches below.

Required Equipment: Harness, Large locking pearabiner, all other carabiners, runners, practice rope section, 6mm perlon slings, belay device, personal tether.

a) **Water Knot**: used to tie two ends of tubular webbing / slings together
b) **Double Fisherman's**: used to tie two ends of perlon together; to tie two rope ends together; to finish a loose end on a Figure-8 (or Bowline)
c) **Figure-8 Loop**: attachment of end of rope to carabiner or middle of rope when one direction of pull is expected
d) **Rewoven Figure-8**: tying in end of rope to harness; attaching rope to anchor without carabiners
e) **Butterfly Knot**: used to make a loop in middle of rope when pull may be exerted in either direction
f) **Bowline**: used to make a non-slipping loop in the end of a rope; *not currently recommended as a climbing knot*
g) **Double Bowline**: used to tie into harness at the middle of the rope
h) **Clove Hitch**: used when making adjustments to anchor tie-in but always backed up with Figure-8
i) **Girth Hitch**: used to attach tied loops of sling or perlon around anchors; also through harnesses or carabiners without having to open them
j) **Münter Hitch**: for friction belay from Pearabiner
k) **Prusik Knot:** adjustable friction knot used for ascending a rope
l) **Mule Knot**: used by belayer to "tie off" a fallen leader so belayer's hands are free
m) **Bowline-on-a-Coil**: used as an improvised tie-in
n) **"Clipping Through**:" the mysteries of the running belay revealed
o) **Double Overhand Knot**: used to tie off end of rappel rope

Web knot-tieing reference: ***Animated Knots by Grog***, www.animatedknots.com

Objectives:

- Learn the standard knots and hitches used in climbing

Outline:

- Demonstrations- Knots in use & Belay Escape
- Knot & Hitch, & Technique Stations

Mule Knot with an Overhand backup

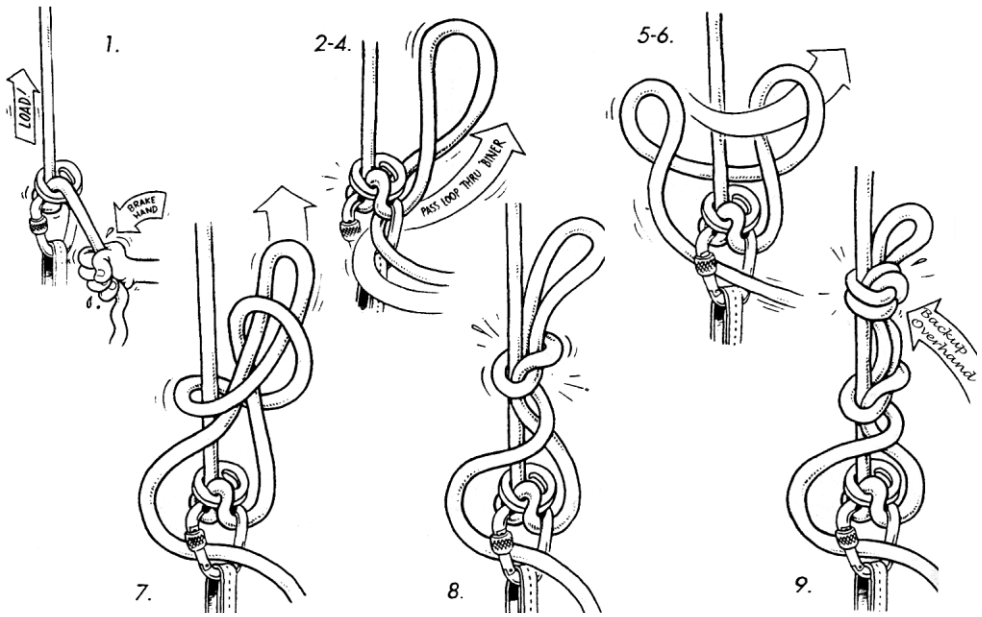
This good knot holds a load when used in conjunction with either a Münter Hitch or a belay plate. It is also a great knot to free your hands safely while belaying.

The overhand backup is necessary to prevent the Mule knot from untying. If the Mule knot alone is used to stop a rappel, it can untie itself; the weight of the rope hanging beneath the knot can apply enough pressure to untie the knot.

Note: Although the Mule knot can be untied while loaded, it can be very difficult to do so. Assume you are using a belay device and locking carabiner. If you load the Mule knot and forget to pass the rope through the locking carabiner before tying the Mule knot, it will lock. To unlock the Mule knot, loop the free end of the rope around your foot.

Stand in the loop to apply pressure to unlock the knot.

To form a Mule knot in conjunction with a belay device:

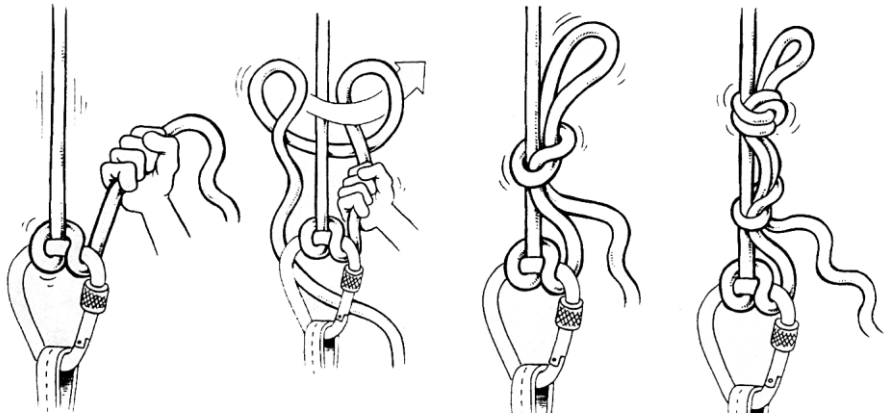


1. From the belayer's perspective, lock the belay device with your brake hand (for this example, assume the brake hand is your right hand).
2. Loop the slack (behind your brake hand) through the locking carabiner on your harness from right to left.
3. Feed the slack under and back to the right of the loaded rope.
4. Form a loop (half-twist – clockwise).
5. Take another bight of the slack and feed it under and to the left of the loaded rope.
6. Form a loop in this bight of rope (half twist – counter-clockwise).
7. Feed this second loop (the left loop) over the loaded rope and through the first loop.
8. Tighten the knot formed with the two loops, leaving a tail.
9. Using the tail, tie an overhand knot on the loaded rope.

It is important to remember that the first loop is always taking the load and the second loop goes through the first (fed over the loaded rope).

Munter-Mule combination

This combination can be used to tie off a loaded rope. It can also be used in place of a Mariner knot when using a cordelette.



When using the Münter-Mule combination, load the Münter Hitch to correctly position the knot before you tie the Mule knot. Tie the Mule knot in front of the Münter Hitch (toward the victim and away from the belayer). Furthermore, when using the Münter Mule combination, do not pass the rope through the locking carabiner before tying the Mule knot.

Rappel setup with Autoblock backup

The following gear is used:

- Seat Harness
- Locking Pearabiner
- Locking Carabiner
- Hero Loop

Rappel:

When preparing to rappel, you can feed a bight into the belay device with either the free end of the rope coming out of the top or out of the bottom. For the Basic class, feed the belay device with the free end coming out of the bottom.

The advantage of this method is that one can easily swap brake hands while on rappel. To do so, simply change brake hands and step over the free end of the rope. This is handy when the rappel route changes direction.

Note: If the free end of the rope is coming out of the top it is not wrong, and many people rappel that way. However, it is very cumbersome to swap brake hands. To do so, you would need to lift the free end over your head. It is even more difficult if you are wearing a backpack.

Autoblock Backup:

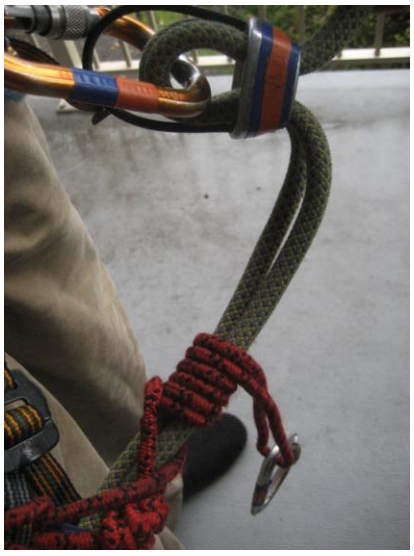
This is the preferred method used to back up a rappel. It can be used at any time but is very effective to back up the following: and injured climber, descending long multi-pitch rappels, rappelling in the dark and when objective danger such as rock or ice fall is present.

The ADVANTAGE of this method is if the climber falters and loses control, the Autoblock backup will automatically lock off the rappel.

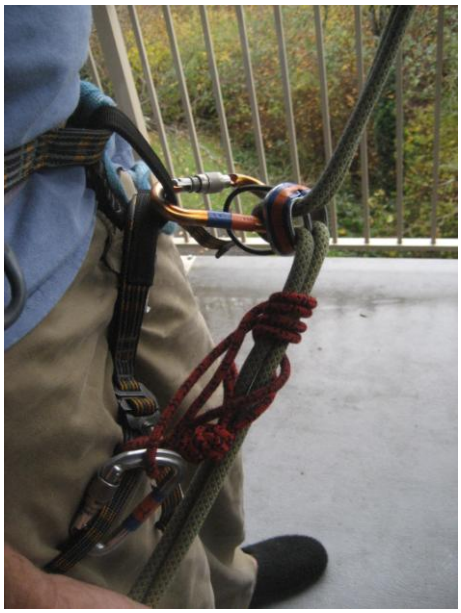
The TRADEOFF of this method is the time it takes to setup. Also, the Autoblock backup adds significant drag to the rappel especially at the top of a double rope rappel. As a result, it's slower descending.

1) Girth Hitch the Hero Loop to the leg loop of the harness. Keep the double fisherman knot close to the leg loop.

2) Wrap the Hero Loop around the free end of the rope. Three wraps is ideal. More wraps will provide more friction. Webbing may be used. However, perlon works better.



3) After wrapping the Hero Loop around the rope, clip the loose end back to the leg loop of the harness using a locking carabineer.



4) When weighted, the Autoblock backup will bite and lock off the belay device. To descend, simply slide the wraps toward the leg loop to release it.

Note: DO NOT use Spectra cord as and Autoblock backup. The Autoblock is subject to a lot of friction, resulting in heat during use. Spectra has a low melting point.

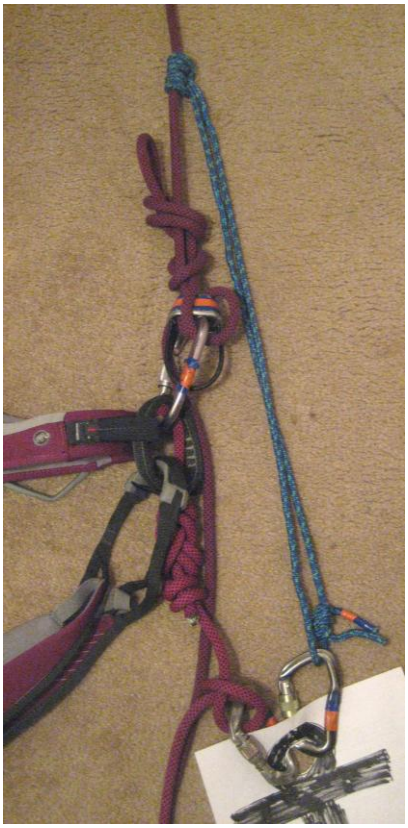
Belay Escape

➔

Step 0: Fall arrested (belayer omitted for clarity)

➔

Step 1: Tie off belay device with Mule knot backed up with an overhand knot. The load is now on the belayer's harness and the belayer's hands are both free.



➔

Step 2: Attach a prusik hitch to the rope and clip it into the anchor. Use only a perlon (nylon). Spectra melts at too low a temperature for friction hitches.

➔

Step 3: Untie the device-Mule and gently transfer the load to the perlon using the belay device. Then remove the rope from the belay device, tie a figure 8 on a bite and clip it to the anchor.

Fundamentals
Field Trip:

Required Equipment: Ten Essential Systems (map is USGS Bellingham South)
Overnight gear *(see equipment matrix on pages 45-46)*
Carabiners, prusiks, runners, personal tether, belay device, helmet, chest harness belay gloves and harness

Objectives:

- Practice climbing techniques
- Practice basic navigation skills
- Practice off-trail travel
- Check backpacking and camping skills.

Outline:

Sat:

1. Hike to Cedar Lake and set up camp
2. Rotate through stations
    - ATC device belay
    - Hip belay
    - Münter belay
    - Rappelling
    - Belay escape
    - Never ending prusik with a pack
    - Knot check and rope coiling

Sun:

1. Navigation course

Field Trip Tips

- Bring a large Ziploc bag for your map so it doesn't get wet and so that it's easily visible & accessible.
- Make sure you're comfortable reading topo maps & using your compass before this trip! If you struggled in the Navigation Lecture/Workshop find a way to refine your skills before Navigation.

Belay Techniques Practice:

Required Equipment: Harness, belay device, personal tether, carabineers

Outline:

1. Climbing Commands
2. Tie in
3. Belay

Rock I: Anchors, Belays And Rappels
Lecture:

Required Reading: ***Freedom of the Hills (8e)*** , Chapters 9-11

Pre-Lecture Assignment: Rock I Quiz

Required Equipment: Climbing harness, chest harness, carabiners, runners, prusik loops, personal tether, belay device, helmet

Objectives:

- Learning the components of roped climbing
    - Belaying, Rappelling, Anchors

Outline:

1. Lecture

2. Quiz Review

3. Stations
    - Belay escape and tying into an anchor
    - Rappel with ATC using autoblock & leg wrap
    - Cat's Cradle Rappel
    - Carabiner Brake Rappel
    - Rope coil & throw using commands
    - Anchor building

Additional Resources:

How to Rock Climb, by John Long Fourth edition © 1998 by Falcon Press
Rock Climbing Anchors: A Comprehensive Guide, by Craig Luebben © 2007 by Mountaineers Books

Ropes, Anchors, and ERNEST

Ropes are a classic symbol of climbing. They are pieces of equipment that set climbers apart from hikers or scramblers. Ropes are important components for both belaying and rappelling. In both cases, safely anchoring the rope in is an absolute necessity.

A few years ago, the American Mountain Guides Association (AMGA) adopted a mnemonic that helped guides to engineer safe anchors. The mnemonic was based on the word SRENE and is described in *Mountaineering : Freedom of the Hills*, among other sources.

Lately, the AMGA has updated its standard and created a new mnemonic for guides and climbers to use. The new guideline for creating a safe anchor is based on the word ERNEST. Let's see how it works:

A safe anchor should be **EQUALIZED**, so that any load can be shared proportionately by all components. Keep in mind that some parts of the anchor and the belay chain may be stronger or weaker than others. Weaker components should have less force applied to them or be backed up.

If any part of the anchor fails, the entire anchor must not fail. Therefore any part that may fail needs to be backed up. Anchors must be **REDUNDANT**.

If by some chance, a part of the anchor does fail, shock loading may have a disastrous effect on the rest of the anchor. If you consider **NO EXTENSION** as a part of your anchor design, the failure of one component should have less effect on the rest of the anchor.

A good anchor is **STRONG**. It has a strength greater than any other part of the belay chain. It is carefully selected, designed and constructed.

You can take all of these to extremes: You can equalize with a backup and then add another backup for more strength and redundancy. You may add sling material to reduce the possibility of extension and shock loading. But how much time do you have for a given pitch, or climb? How much equipment are you willing to carry for anchors? Would the consequences of an unchecked fall be disastrous or inconvenient? Your judgment must take these concepts into account to create an anchor that is **TIMELY**.

As you climb, you will develop judgment. Your partners all hope that it will be good judgment. That judgment will assist you as you create anchors that are equalized enough, redundant enough, have little enough extension, are strong enough and are timely, given your situation.

Watch your instructors and leaders as they place anchors. Analyze the anchors. Look closely at each component. Observe how the anchor is aimed. Notice how much or how little time is needed to set up certain anchors. Ask questions about the anchors. Take every opportunity to learn about anchors as you learn about being a safer climber.

Rock I Quiz **Name:**

1) What knot do you use to tie into the end of a rope?

2) What are some advantages of tied slings?

3) Can non-locking carabineers be substituted for locking carabineers? If so, how?

4) What are three attributes of a good belay location?

5) What is the difference between a dynamic and static rope?

6) What is the primary function of the belayer?

7) How does a belay device work?

8) What are some advantages and disadvantages of a Münter belay?

9) When is a good time to use a hip belay?

10) Why is it important to remember the **ABC**'s of setting up belays?

11) What are the four, basic elements of a rappel?

12) What are some potential problems when rappelling?

13) What does E.R.N.E.S.T. stand for?

Rock I: Anchors, Belays, Rappels, and Basic Rock Climbing Field Trip:

Required Equipment: See Equipment Matrix
Ten Essential Systems
Carabiners, prusiks, climbing harness, chest harness, personal tether, runners, belay gloves, belay device, helmet
NO ROCK SHOES!

Outline:

1. Hike to the top of Mt. Erie.
2. Rotate through the following stations:
    - Belaying
    - Rappel Setup
    - Rappelling (backup with both autoblock and leg wrap)
    - Multi-Pitch Rappelling
    - Belay Escape
    - Anchors (static & dynamic)
    - Carabineer Brake Rappel
    - Cat's Cradle Rappel
    - Hip Belay
    - Climbing

Helmets are mandatory at all climbing stations. Dress appropriately for the weather and be on time!

Field Trip Tips

- All gear should be taped/marked so that you don't lose it or confuse it with others' gear.
- Gear on your harness should be carefully organized & arranged so that it's easy to get to for various stations. Be sure to re-rack your gear carefully after use.
- Slings should be tied up so they don't hang down too far (they should come down to your mid thigh and no lower)!
- You need to be able to access gear for each station. Leave some 'biners free of gear so you can access them.
- Go to the bathroom before you put your harness on & buy a harness that can be unclipped in the back (keeper straps).

Rock II: Climbing Technique
Lecture:

Required Reading: ***Freedom of the Hills (8e)*** , review Chapters 10-11, read Chapters 12-13, Appendix A

Pre-Lecture Assignment: Rock II Quiz

Objectives:

- Combine components of roped up climbing into complete climbing system.
- Practice being a follower
    - Belaying a leader
    - Rope management at belay stations
    - Cleaning the pitch
    - Gear exchange
    - Dismantling anchors
- Explore climbing techniques and terminology

Outline:

1. Lecture
    - Yosemite Decimal System
    - Types of Climbing
    - Climbing Ethics
    - Equipment & Gear
    - How to be a Follower
2. Demonstration
3. Review Quiz
4. Slide Show of Basic Rock Climbs
5. Basic Climbing Skills (Movie - Moving over Stone)

Climber Roles and Responsibilities

	Follower		Leader
1a)	Builds anchor. Flakes out rope (leader's end on top of flaked pile). Ties rope to harness and to anchor with clove hitch. Double checks leader's harness and tie in.	**1b)**	Ties in to climbing rope. Double-checks belay anchor. Double-checks belayer's harness and tie-in.
2a)	Sets up belay. Belays leader: • pays close attention to leader • keeps sufficient slack in rope to prevent leader from being pulled from stance • feeds more slack when leader is clipping a piece of pro • takes back in the excess slack when leader has finished clipping the piece of pro	**2b)**	Climbs pitch, setting pro as needed.
3)		**3)**	Finishes pitch. Builds anchor. Ties in to anchor with climbing rope. Calls "off belay" to follower. Pulls up slack rope.
4)	Takes leader off belay. Puts runner over shoulders to hold pro as it is removed when following. Tends any rope that is being pulled up by leader.	**4)**	
5)		**5)**	Puts follower on belay.
6a)	Breaks down anchor and stows pieces on shoulder runner and/or harness. Follows the pitch: • removes pro while climbing • pull pro first, while keeping it attached to runner and rope • remove the pro from the runner and rack it • remove the runner and biner from the rope and rack it • continue until reaching the belay anchor	**6b)**	Flakes rope in a pile as it is brought up
7a)	Anchors in to the belay anchor. (May use personal anchor or tie-in using the climbing rope and a clove hitch.)	**7b)**	Takes follower off belay.
8a)	Transfers to the leader pro that was removed on the previous pitch. Pieces should be transferred one at a time!	**8b)**	Re-racks pro in preparation for next pitch.
9)	Re-flakes rope so leader's end is back on top		
10)	Puts leader on belay.	**10)**	Removes personal anchor and rope tie-in to belay anchor and leads the next pitch.

Rock II Quiz **Name:**

1) How are falls measured?

2) What is the "V - Angle"?

3) At what degree does having two anchor points become essentially useless?

4) What side of your body should you anchor to while using a device belay? A hip belay?

5) What does the climbing command "cleaning" mean?

6) What items need to be checked before starting a rappel?

7) Explain 4 different climbing techniques.

8) What is the difference between active and passive rock protection?

9) What is the zipper effect?

10) A leader is 30ft off the deck and 5ft above the last piece of pro. If the leader falls at this point how far will they fall?

11) At what point in the pitch is the impact force the highest for the leader?

12) Why is rope management critical?

13) What are some ways you can attach a runner to a natural anchor?

Rock II: Climbing Technique
Field Trip:

Required Equipment: See Equipment Matrix
Ten Essential Systems
Prusiks, runners, personal tether, carabiners, belay device, helmet, belay gloves, chock pick, climbing harness, chest harness and rock shoes (optional)

Outline:

Students will be broken up into small teams and will practice the following techniques over the course of two days.

- Climb with a pack
- Climb with boots
- Rappel with a pack
- Rappel using carabineer brake
- Belay a leader, follow and clean
- Multi-Pitch climbing
- Belay escape
- Set up a top rope anchor
- Climbing different rock features
    - Crack, Face, Slab, Dihedral, Chimney

Snow I: Snow Travel & Ice Axe Use
Lecture:

Required Reading: ***Freedom of the Hills (8e)*** , Chapter 16

Pre-Lecture Assignment: Snow I Quiz

Suggested Equipment: Ice axe

Objectives:

- Safe snow travel

Outline:

1. Snow Gear
    - Ice Axe, Leash Options, Boots & Gaiters, Crampons, Slings and 'Biners, Shovel, Wands, Clothing, Sit Pad, Snow Protection
2. Snow and Winter Camping
    - Shelters- Tents, Igloos & Caves
    - Melting snow
    - Staying warm
    - Ethics
3. Snow Travel Techniques
    - Self Belay
    - Step Kicking
    - Moving in balance
    - Ascending
    - Descending
    - Hard Snow Travel
    - Self Arrest
4. Building Anchors in Snow
    - Belay-Boot Axe
    - Pickets & Bollards
5. Roped Climbing
    - Maintaining Pace
    - Rope Management
    - Running Belays
    - Kiwi Coil
    - Group Arrest
6. Quiz review

Additional Resources:

Alan and Mike¹s Really Cool Backcountry Ski Book, Alan O'Bannon and Mike Clelland. Note: funny book with good tips on winter camping and building snow shelters; hilarious illustrations!

Snow I Quiz **Name:**

1) What knot does the middle person on a glacier team use to tie into the rope and why?

2) What is the purpose of using a chest harness and when does a glacier climber put one on?

3) What makes snow travel trickier than hiking or rock climbing?

4) What are the main functions of an ice axe?

5) At what angle should a picket be placed and why is this important?

6) Why are the belay methods used on snow quicker and less formal?

7) You should always use gloves when using an ice axe. T/F

8) You should use a leash with your ice axe. T/F

9) Why use a kiwi coil?

10) What is the difference between self belay and self arrest grip on an ice axe?

Snow I: Snow Travel And Ice Axe Use
Field Trip:

Required Equipment: Ten Essential Systems *(see equipment matrix)*
Overnight gear *(see equipment matrix)*
Raingear; gaiters; waterproof boots
Sunscreen & snow glasses
Snowshoes with poles
Ice axe, crampons, helmet, harness, runners, carabiners, personal tether, prusiks, chest harness, picket, belay device, shovel

Outline:

Sat-

1. Hike to Self Arrest practice area. Practice all styles of arrest, simulate falling with crampons and glissade.
2. Hike to Austin Pass set up camp.
3. Observe individual camps and discuss snow camping.
4. Walkabout practicing snow travel and ice axe technique.
5. Practice snow anchors (pickets and bollards) and belay techniques, and passing a picket.
6. Kiwi coil demonstration and practice.
7. Z-Pulley demonstration

Sun-

1. Simulate glacier travel-wand use, end runs, running belays, team arrest.
2. Practice team belay.
3. Pack up camp and retreat.

Field Trip Tips

- Don't forget your sit-pad! You'll want a foam piece to sit/stand on.
- Consider checking in with your gear group to see what kinds of stoves others have. It's helpful to have the same type of stove as others. In case of problems you'll have the ability to use others' fuel or spare parts.
- Place your harness and climbing gear someplace where you can easily access it. It's a pain to empty your entire pack in order to dig out your harness.

Snow II: Glaciers and Mountain Weather Lecture:

Required Reading: ***Freedom of the Hills (8e)*** , Chapters 16-17, 27

Objectives:

- Understanding glaciers
- Safe travel on glaciers
- Northwest weather and trip planning

Outline:

1. Glacier travel
   - glacier features (moraines, crevasses, moats, bergschrund)
   - travel among crevasses:
     rope and equipment
     detecting crevasses
     glacier navigation
     approaching crevasses
   - crevasse rescue theory
   - trip planning
     preplanning routes
     white out plan

2. Mountain weather
   - weather forecasts
   - origins of weather
   - local weather patterns
   - where to find weather data

Additional Resources:

Glaciers! The Art and Science of Rescue, by Michael Strong, Eck Doerry, and Ryan Ojerio © 2001 by Falcon Press

The Illustrated Guide to Glacier Travel and Crevasse Rescue, by Andy Tyson and Mike Clelland, 1st edition (2000), Climbing Magazine

Glacier Travel & Crevasse Rescue:Reading Glaciers,Team Travel,Crevasse Rescue Techniques, Routefinding,Expedition Skills, by Andy Selters, 2nd ed (Oct.99), The Mountaineers Books

Mountain Weather: Backcountry Forecasting and Weather Safety for Hikers, Campers, Climbers, Skiers, and Snowboarders, by Jeff Renner, 2005, The Mountaineers Books.

The Weather of the Pacific Northwest, by Cliff Mass, 2008, Univ. of WA Press.

Crevasse Rescue: Step-by-Step Instructions

This describes how a well-equipped rope team of three climbers performs a rescue of an end person's fall into a crevasse. An end person fall is the most likely scenario.

Victim Yells "FALLING!"

First Response

- Rope Team Drops Into Self-Arrest Positions
- Rope team shouts for help from other climbers in the area. Extra help quickens the rescue. These instructions assume no other help is available.
- End person and middleperson communicate about what happened and next few steps.

Initial Anchor Installation

Middleperson Accepts All of the Victim's Weight

- Middleperson adjusts to safest and most comfortable arrest position.
- End person gradually releases self-arrest, transferring victim's load to middle person and maintains readiness to drop back into self-arrest. Holding the victim's weight usually is not difficult for the middleperson due to rope entrenchment into the side of the crevasse.
- End person slides harness prusik (from Texas prusik system) to self-belay while carefully approaching middleperson. End person also probes route for crevasses with ice axe and is ready to self-arrest, should middleperson need help.

End person Installs Initial Anchor

- End person selects a spot for the initial anchor in well-consolidated snow and/or work hardens it, next to the rope, about 6-9 feet on the victim's side of middleperson, conditions permitting.
- End person drives a picket or ice axe vertically into the snow, angled back at lest 20 degrees away from the victim. Pickets are preferred, since ice axes may be needed for rescuer's safety.
- End person clips a single runner into the picket with a carabiner. If an ice axe is used, the runner can be girth-hitched to the axe. A carabiner is clipped to this runner.
- Two doubled loops of 6mm cord are clipped to the runner extending from the initial anchor. This is your Master Loop.
- The end person attaches a loop of 6mm cord to the rope with a prusik knot, then attaches that loop to the Master Loop with a locking carabiner, keeping the gate up and away from the tie-off loop.
- The end person slides the prusik down the rope toward the victim to take slack out of the anchor.

Main Anchor Construction

The main anchor must be strong enough to hold the full weight of the victim for long periods of time, with the absolute confidence that it will not fail.

The End person Determines Type and Location of Main Anchor

- In well consolidated snow, the best anchor is a climber's "deadman" made with a picket or other large, solid object buried as deeply as possible. On ice, the best anchor may be a minimum of two properly placed ice screws.
- The following steps describe constructing a deadman anchor:
- The end person clips a double runner to the Master Loop with a carabiner with the gate up. Stretch the double runner across the surface of the snow toward the spot where the main anchor will be placed.
- The anchor must be sited so that if one anchor or the other fails, there is no extension (The victim does not drop).

The End person buries the "Deadman" and completes the Main Anchor

- The End person digs a pit through the surface layer of snow at right angles to the rope, then digs a slot at right angles to the pit for the doubled runner.
- The End person girth hitches (or clips the doubled runner to the deadman with a locking carabiner) and buries the deadman in the pit so that the runner passes through the slot and up to the Master Loop. Stamping the snow down on top of the pit will allow the snow to work harden and provide for a more secure anchor.

The Middleperson (Aha! Finally!) Transfers the Victim's Weight to the Anchor

- The Middleperson carefully eases out of self arrest position, transferring the victim's weight to the anchor.
- The Middleperson girth hitches a runner or daisy chain to his harness and clips the other end to the Master Loop. S/he then unties from the climbing rope.
- As soon as the middleperson creates slack in the rope above the anchor, the end person ties a figure 8 loop in the rope above the prusik that is holding the victim.
- The end person clips the middleperson's ATC, rescue pulley, and a locking carabiner to the rope, between the prusik and the figure 8 knot. The locking carabiner is attached to the Master Loop with the gate up and locked.
- The figure 8 knot is temporarily attached to the Master Loop with another gate up carabiner. This provides a temporary, but secure, backup should the prusik fail.
- Review the anchor construction to ensure that each anchor is clipped to the Master Loop with carabiners with their gates up. The tie-off prusik and rescue pulley carabiner are also clipped to the Master Loop.

Perform Rescue

End person Approaches Crevasse Lip

- Rescuers pool gear so that end person has a rescue pulley, tie-off loop, carabiners, runners, and ice axe to take to the crevasse lip. With these, all three rescue methods can be implemented.
- End person pulls slack created when middleperson untied from rope through their harness prusik. Cautiously approaches the crevasse lip, sliding the prusik along the rope as a self-belay. If enough rope is available, the middleperson can belay the end person to the crevasse lip.
- End person tries to establish voice contact with the victim in the crevasse to provide reassurance and to gain information about the victim's condition.

End person Selects Rescue Method to Employ

- End person evaluates both the victim's condition and the condition of the crevasse lip to select one of the three following options.
    1. If many rescuers are available and the rope will not entrench, use the quick Indirect Pull.
    2. If the victim is able to contribute to the rescue, has one good hand, and there is enough extra rope to lower a bight, use the Single (C) Pulley Method, particularly if the rope is badly entrenched in the crevasse lip.
    3. If the victim is unresponsive or unable to assist, or the rope will not entrench, use the Z-Pulley.

End person Pads Crevasse Lip With Ice Axe

- End person places an ice axe directly beneath the rope going to the victim, at right angle to the rope, and as close as safely possible to the crevasse lip.
- End person makes certain that the head of the ice axe is on the downhill side, with the pick implanted, so that neither the rope to the victim or another rescue rope will slide off the axe during the haul.
- End person anchors the ice axe to prevent it from falling into the crevasse.

End person Prepares Hauling System for Selected Rescue Method

- If Indirect Pull is used, no additional preparation is necessary.
- If Single (C) Pulley method is used, end person takes a bight of rope in the slack beyond his/her harness prusik , attaches a rescue pulley and carabiner to this bight of rope, then lowers the rescue pulley and carabiner over the padded crevasse lip to the victim. Victim clips the lowered rescue pulley and carabiner to their seat harness or loop formed by their figure-8 tie-in knot.
- If Z-pulley is used, end person attaches tie-off loop with a prusik knot to the victim's rope near the crevasse lip. End person then takes a bight of the rope in the slack beyond/below the harness prusik and attaches a rescue pulley and carabiner to this bight of rope.
- (All methods) End person returns to position near middle person, sliding harness prusik as a self-belay. Once back to the anchor area, end person ties in with a runner to the Master Loop on the main anchor.

Together, End person And Middleperson Haul Victim From Crevasse

- If Indirect Pull is used, several rescuers haul on end of rope until the victim is rescued from crevasse. This method offers no mechanical advantage, but is a quick and easy option if many rescuers are available.
- If Single (C) Pulley method is used, the figure-8 loop at the initial anchor remains in place while rescuers haul. A piggy back system can be used for more pulling power if necessary.
- If Z-Pulley is used, middleperson unclips the figure-8 loop from The Master Loop and then unties this knot. Both rescuers haul on end of rope. Note that the prusik knot in tie-off loop at initial anchor is self-tending. This other tie-off loop that the end person attached to the victim's rope near the crevasse lip (the working prusik) will be pulled closer to the rescuers as they haul. When the working prusik approaches the initial anchor, both rescuers gradually relax their hold on the rope so the self-tending prusik in the initial anchor holds the victims weight. (The working prusik must not get too close to the initial anchor or the Z may suddenly collapse, causing all loss of mechanical advantage and necessitating resetting the Z-Pulley.) While the self-tending prusik is holding the victim's weight, the end person slides the working prusik knot along the rope (while self-belaying), resetting it close to the crevasse lip. End person returns to position near the middleperson and together they resume hauling until the victim is carefully extracted from the crevasse.

Notes

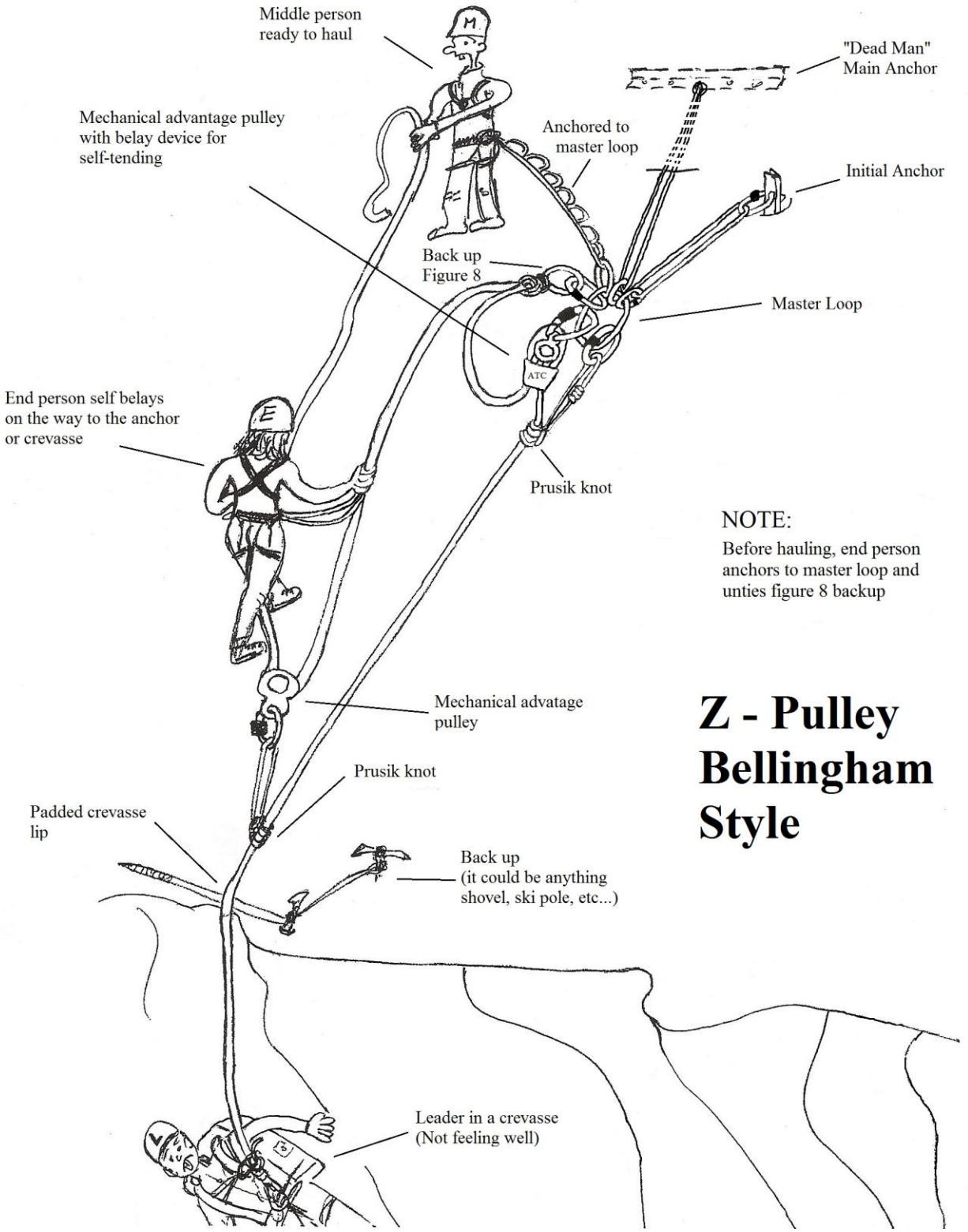
Rescuers

- Frequently a combination of methods can be used. For instance, the victim can climb or prusik most of the way out of the crevasse, then a Single (C) Pulley can be used to get the victim over the crevasse lip, often the crux of the rescue.
- When hauling, rescuers can use extra prusiks as handles on the rope.
- With any mechanical advantage system, be especially careful as the victim approaches the lip of the crevasse during hauling. Previously the victim has been hauled straight up, but near the crevasse lip the force of the pull tends to pull the victim in, towards the crevasse wall, potentially causing serious injuries to the victim. Fatalities have occurred from overzealous hauling.

Victim

- During the accident, remember to yell "Falling!" Spread-eagle your body to try to slow or stop your fall.
- Hang onto your ice axe during the fall.
- When you stop falling, check your climbing rope tie-in, then clip the climbing rope temporarily onto the carabiner on your chest harness. The chest harness will need to be unclipped when you reach the lip of the crevasse.
- Tie your ice axe off out of the way.
- Remove your pack and clip it to the rope below your prusiks.
- Climb or prusik all or part way out if you are able. If climbing the side of the crevasse, remember to slide your prusiks up as you go (self-belay)
- If you are unable to prusik or climb, dress warmly and use your parka hood to keep falling snow out of your clothing.
- Do not waste energy yelling without reason. Your rope partners are working on rescuing you safely. They won't be able to hear your whining anyway.

Z-Pulley Crevasse Rescue



Adapted 2006 by Predrag Vadjic and Matt Roelofs from a 1992 handout by Loren Foss and Ross Prather, with input from Dave Anthony, Dan Bean, Glenn Eades, Allen Frees, Marcia Hanson, Sam LeBarron, Dave LeBlanc, Bob Shafer, Ken Small and Erhart Wichert. 1995 update by Zac and Becky Segal. 2012 update.

Crevasse Rescue Techniques Practice:

Required Equipment: Climbing harness, ice axe, carabiners, runners, prusiks, cordalette, personal tether, rescue pulley, belay device
Headlamp

Outline:

1. C-pulley set-up and practice

2. Z-pulley set-up and practice

Snow II: Glacier Travel and Crevasse Rescue Field Trip:

Required Equipment: Ten essential systems (*see equipment matrix)*
Overnight gear *(see equipment matrix)*Ice axe, crampons, runners, prusiks, personal tether, carabineers, harness, chest harness, helmet, shovel, rescue pulley, picket.

Outline:

Saturday:

1. Hike to camp & set up
2. Practice crevasse rescue
3. Practice group arrest and snow anchor practice

Sunday:

1. Roped glacier travel
2. Crevasse identification/probing
3. Crevasse Rescue
4. Break camp and hike out

Final Exam

Required Reviewing: ***Everything that you have read in your courses to this point***

Required Equipment: Soft pencil and eraser
Knot tying practice rope
Gear needed for basic rock climb with steep snow approach

The exam will have a variety of formats and is open book.
Material on this exam may cover:

- Equipment
- Avalanche Avoidance and Rescue
- Navigation
- AFA and Wilderness Emergency Response
- Rock Climbing or Scrambling
- Snow Climbing or Scrambling
- Glacier Travel (for Climbers)
- Miscellaneous topics that have come up but do not fit into any of the above

Snow III: Hard Snow
Field Trip:

Required Reading: ***Freedom of the Hills (8e)*** , Ch. 16, 20, 26

Required Equipment: Ten Essential Systems (*see equipment matrix)*
Overnight gear (*see equipment matrix*)
Raingear; gaiters, waterproof boots, Sunscreen & snow glasses,
Ice axe with head guard, crampons, helmet, harness, carabiners,
runners, prusiks, personal tether, picket,

Outline:

Purpose of this field trip: to practice snow travel, use of the ice axe, and crampon technique, under real-world spring and summer conditions.

1. Crampon Techniques-Flat footing, climbing in balance, low dagger, 3 o'clock.
2. Self Belay
3. Plunge Stepping
4. Simulated glacier travel using and testing pickets
5. Self Arrest
6. Team Belay
7. Belaying or lowering a victim
8. Glissading
9. Rappelling

Alpine Ice: Basic Techniques for Travel
Field Trip:

Required Reading: ***Freedom of the Hills (8e)*** , Ch. 18

Required Equipment: Ten Essential Systems (*see equipment matrix)*
Raingear; gaiters; waterproof boots
Sunscreen & snow glasses
Ice axe with head guard, crampons, helmet, harness, carabiners, runners, prusiks, personal tether,

Outline:

Purpose of this field trip: to practice travel on alpine ice, use of the ice axe, and crampon technique, under real-world summer and fall conditions.

1. **Glacier Talk** (features, ice flow, compression zones and icefalls)

2. **Walking on ice** without crampons (gentle terrain).

3. **Step cutting** on short small ice ramps.
   Including diagonal steps and making a turn, and sidesteps for descending.

4. **Alpine Ice Talk** (brief discussion of the proper conditions to make an ice ascent and a bit of ice climbing history)

5. **French Technique** (crampons on)

6. **Pied** (foot positions)
   Marché, À plat, En canard, & Troisième.
7. **Piolet** (ice axe positions)
   Canne, Rampe, Ramasse, Poigard, Panne, "Allain," Manche, Appui and Ancre.

   We'll use some top ropes so students can practice on slightly steeper and longer slopes safely.

Climbing Course Graduation Application

This form is to be completed and mailed to the climbing committee in care of Steve Glenn, 1407 Abbott Road, Lynden, WA 98264; 360-691-5274; geartest@earthlink.net) AFTER completing all the course and graduation requirements but BEFORE **September 30th**. Please remember to include your completed course evaluation form with your application.

NAME:

ADDRESS:

PHONE: (home) (work)

I wish to apply to the Climbing & Scrambling Committee for graduation from the Bellingham Mountaineers:

- o **Basic Mountaineering Course**
- o I wish to apply to the Climbing Committee for a **second year extension**.

I have met the following requirements (give dates):

1. Attended all lectures:
2. Passed all quizzes:
3. Completed the AAFA course:
4. Participated in the following trail work activity:
5. Successfully completed the following field trips (give dates):

	Avalanche:		Rock II:
	Fundamentals:		Snow I:
	Rock I		Glacier Travel:

6. Completed the written final exam:
7. Completed the following Basic Experience Climbs (give name of peak, date, and name of leader):

   Basic Rock:

   Basic Glacier:

   Alpine or 2nd Rock/Glacier:

Evaluation Of Basic Mountaineering Course

We want feedback! To help us improve future basic mountaineering courses, please answer the following questions. Also, please rate each class from 1=poor to 5=outstanding. Make any additional comments you wish.

Thank you for your input!

Lecture: Introduction _____
Comments:

Lecture: Equipment _____
Comments:

Advanced Alpine First Aid (AAFA) _____
Comments:

Lecture: Avalanche Awareness _____
Comments:

Field Trip: Avalanche Awareness _____
Comments:

Lecture: Navigation Part I _____
Comments:

Lecture: Navigation Part II _____
Comments:

Lecture: Rope Handling and Knots _____
Comments:

Field Trip: Fundamentals: Navigation and Route-Finding _____
Comments:

Lecture: Rock Fundamentals I: Anchors, Belays and Rappels _____
Comments:

Field Trip: Rock Climbing I _____
Comments:

Rock Wall Indoor Practice _____
Comments:

Lecture: Rock Fundamentals II _____
Comments:

Field Trip: Rock Climbing II _____
Comments:

Lecture: Snow I: Snow Travel _____
Comments:

Field Trip: Snow I — Snow Travel and Ice Axe Use _____
Comments:

Lecture: Snow II — Glacier Travel _____
Comments

Crevasse Rescue Practice _____
Comments:

Field Trip: Snow II — Glacier Travel and Crevasse Rescue _____
Comments:

Field Trip: Snow III — Hard Snow Techniques _____
Comments:

Field Trip: Alpine Ice — Basic Travel Techniques _____
Comments:

Required Equipment Matrix

X = Required
O = Optional
T = Ten Essential Systems

		FIELD TRIPS							CLIMB	
		AVVY	FUND	ROCK I	ROCK II	SNOW I	SNOW II	SNOW III	ROCK	GLAC
A.	**TECHNICAL EQUIPMENT**									
1	4 single runners and 2 double runners (1-inch tubular nylon) and daisy chain / personal tether		X	X	X	X	X	X	X	X
2	Prusik slings and tie-off loops (6-mm perlon)		X	X	X	X	X	X	X	X
3	Climbing harness		X	X	X	X	X	X	X	X
4	Chest harness (1-inch tubular nylon)		X	X	X	X	X	X	X	X
5	Climbing helmet		X	X	X	X	X	X	X	X
6	Belay gloves with leather palms		X	X	X				X	O
7	Five matching carabiners		X	X	X	X	X	X	X	X
8	Four locking carabiners		X	X	X	X	X	X	X	X
9	Pearabiner (large locking 'biner)		X	X	X	X	X	X	X	X
10	Rescue pulley (with side plates)					O	X		X	X
11	Ice axe					X	X	X	X	X
12	Crampons (non-rigid)						X	X	X	X
13	Chock pick				X				X	
14	Belay device (NO Figure 8!)		X	X	X	X	X	X	X	X
15	Snow Picket					X	X	X		X
16	Shovel	O				X	X	O		O
17	Avalanche Probe	O								
18	Avalanche Beacon	O								

B	**CLOTHING**									
1	Wool/synthetic cap (*consider fitting helmet over a light-weight balaclava)*	X	X	X	X	X	X	X	X	X
2	Sunhat or bandana	X	O	O	O	X	X	X	X	X
3	Base Layer (no cotton) top and bottom	X	X	O	O	X	X	X	X	X
4	**T** Up to three insulating layers (ref pg. XX)	X	X	X	X	X	X	X	X	X
5	Windbreaker	O	O	O	O	O	O	O	O	O
	Winter coat									
7	Shell	X	X	X	X	X	X	X	X	X
8	Pants (wool/synthetic)	X	X	X	X	X	X	X	X	X
9	Rain pants	X	X	X	X	X	X	X	X	X
10	Gaiters (long preferred)	X	O	O	O	X	X	X	X	X
11	Socks (1-2 pair)	X	X	X	X	X	X	X	X	X
13	Climbing boots	X	X	X	X	X	X	X	X	X
14	Mitts or gloves	X	X	X	X	X	X	X	X	X
15	Mitts or gloves - extra pair	X	X			X	X	X		O
16										
17	Lightweight liner gloves	X	O	O	O	X	X	X	X	X

X = Required
O = Optional
T = Ten Essential Systems

		FIELD TRIPS							CLIMB	
		AVVY	FUND	ROCK I	ROCK II	SNOW I	SNOW II	SNOW III	ROCK	GLAC
C.	**OTHER EQUIPMENT**									
1	***** day pack, frameless or rucksack	X	X	X	X	X	X	X	X	X
2	***** overnight pack	O	X			X	X		(2)	(2)
3	**T** sunglasses (with side screens on snow)	X	X	X	X	X	X	X	X	X
4	**T** sunscreen	X	X	X	X	X	X	X	X	X
5	**T** lip balm with sunscreen	X	X	X	X	X	X	X	X	X
6	**T** water bottle(s)	X	X	X	X	X	X	X	X	X
7										
8	**T** compass	X	X	X	X	X	X	X	X	X
9	**T** map	X	X	X	X	X	X	X	X	X
11	sleeping bag (down/synthetic)		X		X	X	X		(2)	(2)
12	insulating pad for sleeping		X		X	X	X		(2)	(2)
13	tent (can be shared)		X		X	X	X		(2)	(2)
14	**T** emergency shelter (tube-tent, plastic bag, radiant barrier)	X	X	X	X	X	X	X	X	X
15	Toiletries	O	X	O	X	X	X	X	X	X
16	**T** first aid supplies	X	X	X	X	X	X	X	X	X
17	**T** knife	X	X	X	X	X	X	X	X	X
18	**T** head lamp (extra batteries)	X	X	X	X	X	X	X	X	X
21	**T** fire starter	X	X	X	X	X	X	X	X	X
22	**T**Food	X	X	X	X	X	X	X	X	X
23	extra food	X	X	X	X	X	X	X	X	X
24	**T** extra clothing	X	X	X	X	X	X	X	X	X
25	stove / fuel (share)		X		X	X	X		(2)	(2)
26	pot (share)		X		X	X	X		(2)	(2)
27	bowl/cup		X		X	X	X		(2)	(2)
28	Spoon		X		X	X	X		(2)	(2)
29	insulating pad for sitting	O	O	O	O	O	O	O	O	O
30	water purification method	O	X		O	O	O	O	X	X
31	Altimeter	O	O			O	O	O	O	O
32	snowshoes and poles	X				O	O	O		
33	"blue bag"	X				X	X	X		X
34	Student Gradebook	X	X	X	X	X	X	X	X	X

***** *One internal frame pack with overnight capacity that can be compressed for day climbs may be used instead of two separate packs.*

(2) Overnight gear is required on certain rock and alpine climbs and scrambles.

Note: All personal gear should be marked with the owner's name or initials in a prominent place. This helps with identification in the event of loss, theft, or when gear becomes intermingled with that of others. Carabiners and similar articles should be marked with paint, enamel nail polish, or auto tape in a distinctive color or pattern. Clothing should be marked also. If you lose something on a field trip or climb, contact the trip leader to see if it was turned in.