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COURSE SYLLABUS -
UAS PE 218P/ODS 218
Avalanche Evaluation and Theory Level 2

PE #37199 Sec J01, ODS #37198 Sec J01.
Course Dates 20120319 to 20120401, 2 credits.
Begins: required classroom 7:00 - 9:30 pm Tues. Mar. 19; through evening session Monday, Apr. 1
All Classroom Sessions JREC 115
Evening classroom sessions March 19, 21, 26, and 28; April 1
Required Outings Saturdays and Sundays March 23, 24, 30, and 31
Instructor Bill Glude

Instructor Information

Name:
Bill Glude

UAS office:
I do not have a UAS office, but I am available for a short time immediately after classes to meet with students, or you can contact me directly to set up a time and place to meet.

Home office (mailing) address:
PO Box 22316, Juneau, Alaska 99802

Phones:
586-5606 home office, 523-8900 fax and main office, 206-617-7703 cell.

Personal E-mail:
I will list it in two parts to foil the spammers' web crawlers that automatically harvest e-mail addresses from websites. The username, or first part, is snowcom01, and the name of the server, which follows the conventional symbol for at is me.com. I may not be able to respond immediately, but I do check it daily when I am in town or able to get a decent Internet connection.

Course Website

We will be using the PE section course website on UAS Online for our announcements, syllabus, and other special items for this UAS course. We will post the course handouts as class time approaches. We usually post updates before each topic is covered during the fall course and as new information or improved presentation comes up during the season. Be sure to check the course site before each session for the latest updates and course announcements.

Go to UAS Online and search the appropriate semester for "avalanche", then go to the PE section.

Course Schedule

NOTE: This schedule is a framework, not a fixed schedule. It will evolve as we customize the course to group interests, weather conditions, and available materials. We may juggle components to suit our needs. Check the date at the top of the syllabus to be sure you have the most-current version.

The schedule is too full to have much time for reading during the course, Be sure to read the course handouts and at least skim the textbook and the fieldbook key pages before the course begins.

Day 1

Evening Classroom, 7:00 to 9:30 pm

Introductions
Overview
Course Format, Liability & Risk, Forms
Rescue for Leaders
Field Trip Logistics
Forecasting Exercise, if time allows

Day 2

Evening Classroom, 7:00 to 9:30 pm

Mountain Weather
Forecasting Exercise
Snowpack I- Mechanics, Crack Propagation & Fracture Initiation
Forecasting Exercise

Day 3

Rescue Field Session, 7:15 am to 6:00 pm

7:15 am UAS; 7:45 am Eaglecrest.
Travel to Eaglecrest; climb to field area.
Rescue for Leaders:
- **Review & Update**
- **Flux Line Mapping**
- **Teaching Beacon Search**
- **Probe Line Setup**
- **Timed Practices**
- **Deep & Multiple Beacons**
- **Leadership & Organization**
- **Advanced Drills & Scenarios.**

Set Up Experiments:
- **String Site**
- **Creep Columns**
- **Baseline Profiles**

Travel back about 5:00 pm, arrive UAS about 6:00 pm.

Day 4

Snow Study Field Session, 7:15 am to 6:00 pm

7:15 am UAS; 7:45 am Eaglecrest.
Travel to Eaglecrest; climb to field area.
Snow Experiments as Conditions Merit:
- **Dye Percolation Tests**
- **Daily Creep & Settlement Experiments**

FIeld Snow Study Techniques & Investigations:
- **Review of Level 1 Techniques**
- **Introduction of Level 2 Techniques**
- **Stability 1 Observations**
- **Stability 2 Slope and Traveling Tests**

Stability 3 Snowpits, note taking for classroom session

Travel back about 5:00 pm, arrive UAS 6:00 pm.

Day 5

Evening Classroom, 7:00 to 9:30 pm

Snowpack II - Metamorphism for Avalanche Forecasting
Note-keeping Practical; Mark Gear for AK Blocks
Guest Speaker, Special Topics

Day 6

Evening Classroom, 7:00 to 9:30 pm

Snowpack III - Advanced Stability Evaluation
Human Factor
Glaciers & Ice Avalanches

Day 7

Snow Science & Risk Management Field Session I, 7:15 am to 6:00 pm

7:15 am UAS; 7:45 am Eaglecrest.
Travel to Eaglecrest; climb to field area.

Snow Science Experiments:
- **Record Results**
- **String Site Profiles**
- **Creep Column Results**

Snow Experiments as Conditions Merit:
- **Dye Percolation Tests**
- **Daily Creep & Settlement Experiments**
- **Fracture Investigations**

Risk Management Problems:
- **Route-finding**
- **Stability Evaluation**
- **Belayed Tests & Cornices**
- **Terrain Choices, Risk Management & Decision-making**

Travel back about 5:00 pm, arrive UAS 6:00 pm.

Day 8

Snow Science & Risk Management Field Session II, 7:15 am to 6:00 pm

7:15 am UAS; 7:45 am Eaglecrest.
Travel to Eaglecrest; climb to field area.

Snow Science Experiments:
- **Record Results**
- **String Site Profiles**
- **Creep Column Results**

Snow Experiments as Conditions Merit:
- **Dye Percolation Tests**
- **Daily Creep & Settlement Experiments**
- **Fracture Investigations**

Risk Management Problems:
- **Route-finding**
- **Stability Evaluation**

Belayed Tests & Cornices
Terrain Choices, Risk Management & Decision-making
Wrapup, Travel back about 5:00 pm, arrive UAS 6:00 pm.

Day 9

Evening Classroom, 7:00 to 9:30 pm
Advanced Terrain - Steeps & Sluff Management
Continuing Education
Guest Speaker, Special Topics

Course Requirements

Same as Level 1:
If you are looking for a couple easy credits or just a chance to go skiing and snowboarding, you are in the wrong course! Drop it or change to an audit right now, and we will all be happier. On the other hand, if you are looking for a challenging and rewarding course in which you will learn fascinating things about living in places with snow and avalanches, this is where you belong.

Avalanche study is a complex subject, and your understanding of it can make a life or death difference. We make it fun to learn, but dealing with avalanches is a serious topic. This class is comparable to an in-depth emergency medical course in that you need to learn the underlying scientific principles and be able to apply them under stress. We cover a lot of material in a short time, you will need to be present and focused throughout to keep up.

For Level 2:
In order to pass, you must at least meet the minimum American Avalanche Association standards for a Level 2 avalanche course, which includes the topics covered in all four required field days, at least five of the six the classroom days, and at least a 70% average score on the tested skills. You must have the UAS liability release, medical history, and insurance forms filled out before the field trips, must attend the pre-trip logistics session, and must have all the required gear to go. Arrange your schedule now to keep the field trip times free, get the forms in, and attend the pre-trip logistics session. If you get sick or have to work, we are sympathetic, but you will not have completed the requirements and we cannot pass you.

Prerequisites for this Level 2 course include successful completion of a Level 1 course at least as comprehensive as ours.

Same as Level 1:
We are fortunate to be able to do this course within the University system. Risk management for our group is a primary concern. We must strictly observe the following rules for our field trips:

* We go out as a group and we return as a group - no exceptions. If you arrive late, after we have left the trailhead, you will not be allowed to join the group. No early departures are allowed. If anyone has trouble in the field, we must all be prepared to stick together and stay to help for as long as it takes. Arrange your schedule now so you have the evenings after field days open.

* We function as a group in the field. No one goes ahead of the instructor without specific permission, and we must stay within easy communication distance of each other. This rule does

not change when we heading in at the end of the day. Anyone who disregards instructions for safety and conduct of the class, or engages in activity that puts any or all of us at risk will not be allowed on further field trips.

* The field trips require a high level of physical fitness to reach suitable areas. We will not be camping, but we must climb anywhere from 280-710m (900-2,300 feet) and travel 2- 5km (1-3 miles) through trail-less country each field day. Conditions may include mud, swamp, and bushwhacking as well as snow, which may be deep or wet. Our usual field area is Mt. Troy, the mountain on the left above the upper cross-country loop as you ride up the lift at Eaglecrest.

* You must be comfortable with whatever you will have on your feet on 20-25 degree slopes (like Hooter lift at Eaglecrest) in good snow; and be able to travel effectively when the snow is bad or the slope is 35-45+ degrees (like the advanced runs at Eaglecrest).

* You need not be an expert skier, boarder, or winter mountaineer by any means, but you must have the physical conditioning and winter travel skills necessary for safety in our field conditions and for keeping to our schedule. This course is not for outdoor novices. If you do not have the necessary basic fitness and winter travel ability, we cannot allow you to participate in the field trips.

* The course also requires the gear and skills to stay comfortable and warm outdoors for long periods in sometimes-terrible weather. If you show up without the required equipment, food, fluids, and clothing, you put all of us at risk and we cannot allow you to go with us into the field. Review the equipment list and be sure you bring everything on it.

* Sorry, we like dogs, but both University and ski area policies prohibit them on our field trips.

* No earbuds during field sessions! This includes our time climbing the uptrack, where we will be pausing periodically to discuss observations. The course will require your undivided attention.

* Any injuries on field trips must be reported promptly to the instructor.

* No one leaves the parking lot at the end of the day without checking with the instructors. We must confirm that everyone is back safely.

* If we are out several days in a row, you may keep gear that has been checked out to you until the end of that session but must turn it in before you leave on the final day. We must confirm that your gear is checked in before you leave the parking lot.

We also must note that this course is dependent on snow conditions which are beyond our control. If there is not enough snow in our field areas, we will have to defer all the grades until we can complete the field portion of the course. We will do our best, but will only be able to schedule a maximum of two makeup opportunities.

For Level 2:

* The field trips require a high level of physical fitness to reach suitable areas. We will not be camping, but we must climb around 700m (2,300 feet) and travel about 5km (3 miles) through trailless country each field day. Conditions may include mud, swamp, and bushwhacking as

well as snow, which may be deep or wet. Our usual field area is Mt. Stewart, the mountain on the right above the upper cross-country loop as you ride up the lift at Eaglecrest.

* You must be comfortable with whatever you will have on your feet on 30º-45º+ slopes (like the East Bowl Chutes or most West Bowl runs) in good snow, and be able to survive them in variable snow. Elegance is not a requirement; just functional travel ability. We will adjust routes to allow snowshoe travel under the conditions we have.

We also must note that this course is dependent on snow conditions which are beyond our control. If there is not enough snow in our field areas, we will have to defer everyone's grades until we can complete the field portion of the course. We will do our best, but will only be able to schedule two makeup opportunities.

Scope of the Course

The Level 2 course is an advanced recreational or entry-level professional course. It is a backcountry course with a strong field orientation. Topics include overview of advanced avalanche study, rescue for leaders, metamorphism for avalanche forecasting, keeping avalanche field notes and weather records, forecasting exercises, mountain weather, advanced terrain - steeps and sluff management, group snowpit and fracture profiles, avalanche fracture, release, and dynamics, current avalanche research, glaciers and ice avalanches, and advanced practical field exercises, belayed tests, steep techniques, and snow science experiments.

It is intended for people who have had some field time to practice what they learned in the Level 1. The material covered is similar to that in the Level 1, and does include a bit of review, but it goes into much greater depth. The Level 2 course assumes that you will be in a position of leadership, whether in a formal position such as guide or group leader, or in an informal position such as a more-experienced person in a group of friends. It aims at clearing up gray areas in your understanding, with particular focus on snow stability evaluation. We emphasize being able to record and clearly communicate what you have found to others. We spend some time with field experiments that help you to understand snow processes. We include advanced techniques like belayed testing and ways to release cornices, and work in more-challenging terrain. We move faster and cover more ground. We try to make the decisionmaking exercises more like real-life situations, and emphasize drills and practice so you learn by doing.

The fieldwork is critically important for this course. Be sure to clear your calendar so you can attend all **four required field days**. These four days will present a sequence of essential course components: rescue, setting up snow experiments, stability evaluation, decisionmaking, and gathering experimental results. Each of these component days builds on the previous ones, and completion of the entire sequence is necessary to fulfill the minimum course requirements.

Required Texts and Field Snow Study Equipment

1. ***Staying Alive in Avalanche Terrain***; by Bruce Tremper, The Mountaineers Books, Seattle, WA 2008. This is an excellent recent text that contains lots of information without being overly technical or irrelevant. It is very readable and well presented. We use it for both Level 1 and 2 courses. It is available locally at the bookstore.
2. ***Snow, Weather, and Avalanches: Observational Guidelines for Avalanche Programs in the United States***, by the American Avalanche Association, PO Box 2831, Pagosa Springs, CO

81147, www.americanavalancheassociation.org , this one is required and is the standard reference.

3. A **Celsius dial stem thermometer**, if we can get them at the bookstore. The best online source is Life Link, http://www.garmontusa.com/llsnowstudy.html
4. We will continue to use the same field study equipment as Level 1, but **you will use and need these three items on every field day in Level 2:**
   A. **Fieldbook** - You will need a fieldbook for our snow study sessions. A looseleaf avalanche fieldbook designed for these courses should be available at the bookstore. We use these for both Level 1 and 2 courses. Replacement pages are available online through Alaska Avalanche Specialists.
   B. **Clinometer/crystal card** - You will need a clinometer/crystal card like the ones produced by the Alaska Mountain Safety Center and available at the bookstore. We use these for both Level 1 and 2 courses.
   C. You will need a **10x hand lens** for snow study. Set up the crystal card with the hand lens as the clinometer weight, or just use the bicycle spoke trick. We use these for both Level 1 and 2

Optional Additional Level 2 Text

The Avalanche Handbook, by the Mountaineers, 2008. This is the best technical overview. It is readable and full of photos and graphics. We decided not to require this one, but we encourage you to get a copy and check it out, or grab one from the library when you can.

Personal Field Gear

Clothing - Same as Level 1

You must have enough clothing to be out in the field all day, regardless of the weather. Our studies require us to stand around and be in contact with the snow far more than you do on a typical recreational day. Bring at least two layers more than you usually wear. Bring chemical heat packs if you have chronically frosty fingers or toes or if it is a cold day. If you are snowshoeing and tend toward cold toes, hiking boots are not warm enough for cold days. Wear insulated boots like Sorels or a warm pair of snowboard boots, big enough for two pairs of socks without being too tight, and keep the laces loose. Wear extra-warm layers on your legs and torso, too.

Do not rely on movement for warmth. We must be able to stop for variable and often long periods in order to teach the course. We cannot move just because you are cold. Your warmth is your responsibility.

Similarly, we cannot move because you are impatient. We must pace ourselves to slower group members and will spend far more time talking, observing, and practicing skills than you do on a recreational day. This is a course, we are here to learn. You can travel fast and ride hard on other days.

Required Clothing

long underwear - synthetic, silk, or wool; NOT cotton!
shirt or turtleneck - synthetic, silk, or wool; or heavy long underwear
at least three warm insulating layers, such as: fleece vest, fleece jacket, wool sweater, fiberfill coat or vest, or pile coat or vest
shell parka - waterproof breathable preferred; NOT cotton!
pants - shell and insulation, such as: wool pants, warmup bibs, or fleece pants plus waterproof breathable bibs; NOT cotton; no jeans or Carhartts!

gaiters - if they are not built into your pants
warm boots and socks
warm hat - like a stocking cap or beanie
mitts or gloves

Recommended Clothing

neck gaiter or scarf
baseball hat for warm, sunny days
extra set of mitts or gloves

Field Gear - Same as Level 1

Required Field Gear

+ beacon
+ probe
* shovel - sturdy, lightweight avalanche shovel - NOT a discount store shovel!
* day pack - a good rucksack with straps or pockets for all your gear, including shovel and boards
A way to get around efficiently in the snow - no postholing!
    1.) Mountain skis, telemark or alpine touring, with skins and poles. (+ Alpine Trekker touring adapters and skins for your alpine ski gear are available through ODS, but you need to arrange to fit them in advance.)
    2.) OR snowboard with * snowshoes or approach skis and poles for uphill travel.
    3.) OR splitboard with skins and poles.
    4.) OR * good mountain snowshoes. (Will be fine for both uphill and downhill; ski poles strongly recommended.)
* head lamp
pocket knife
lunch
insulated water bottle or thermos - at least one liter of fluids
sun glasses - required after mid-February; optional early season
sun screen and lip protection - required after mid-February; optional early season
toilet paper and lighter
blister kit and band aids
fieldbook and pencil
clinometer - we have combination clinometer/crystal cards
hand lens - 10x best, for snow study

Recommended Field Gear

map and compass
emergency medical kit - strongly recommended
camera with memory cards and spare batteries
spare headlamp and beacon batteries
ski poles - essential for ski travel; strongly recommended for snowshoers
goggles - strongly recommended for skiers and snowboarders
helmet - strongly recommended for skiers and snowboarders

snow saw
binoculars
cell phone (emergencies-only, otherwise keep it off)

* Items available for checkout at the Student Activity Center; must be picked up ahead of departure time, during normal SAC hours. Adjust snowshoe straps to your boots before the field trip, it is much easier indoors.
+ Items available for checkout from the ODS program. Skins and Alpine trekkers must be fitted ahead of time. We will check out the other ODS gear at the end of the first evening class session.

TEST NEW OR BORROWED GEAR BEFORE THE COURSE!

Group Gear - Same as Level 1

Required Group Gear

group emergency medical kit
snow study kit
maps
fire starters
radio or phone

Optional Group Gear

foam pad
bivvy sack or tarp
wax

Additional Resources - Same as Level 1

1. *The Avalanche Handbook*, by McClung and Schaerer, The Mountaineers Books, 3rd Edition 2006. This is the best technical overview. It is readable and full of photos and graphics. It should be available locally at the bookstore, or from the Alaska Avalanche School in Anchorage.
2. *Snow, Weather, and Avalanches: Observational Guidelines for Avalanche Programs in the United States*, by the American Avalanche Association and the USDA Forest Service National Avalanche Center, The American Avalanche Association, PO Box 2831, Pagosa Springs, CO 81147. This is the most-current and best observations handbook available anywhere. This is a Level 2 text that will be of interest to serious Level 1 students.
3. *The Avalanche Review*, published by the American Avalanche Association, PO Box 2831, Pagosa Springs, CO 81147. (Full conflict of interest disclosure: I serve as this organization's Treasurer.) The best current information from the professional association of avalanche specialists in the US, anyone can subscribe. If you want to be plugged into the avalanche network, this is your best periodical.

Avalanche Websites - Same as Level 1

* Westwide Avalanche Network
  http://www.avalanche.org

The source link to most North American and European avalanche centers, accurate and current forecast information from the Forest Service and European centers; variably accurate information from others.

* Alaska Avalanche School
  http://www.alaskaavalanche.com/
  The Anchorage-based avalanche and mountain safety education nonprofit for Southcentral, western, Interior, and northern Alaska.

* Cyberspace Avalanche Center
  http://www.csac.org
  Comprehensive avalanche information: education, accident reports and statistics, resources, articles, forecasts from most US forecast centers in a standardized format.

* Canadian Avalanche Association
  http://www.avalanche.ca/
  The original source of Canadian avalanche information.

Grading

Ordinarily, I tell avalanche students that the motivation to learn this material is that it may very well save your life. The true final exam comes in about thirty years. If you are still out in the mountains, you have passed. You flunk if you get killed, but you also flunk if you get so scared that you quit going out and having fun in the snow.

Staying alive and happy should be enough motivation, but the University requires that we evaluate your participation by grading on at least a pass-fail basis, unless you audit. Much of what we will be doing involves *learning by screwing up*, scenarios and exercises where you learn best by jumping in enthusiastically, with both feet. We will not grade on activities where you need to experiment, practice, and learn without being judged, especially in the field.

PE Students' Requirements for Pass Grade

In order to pass the course, you must at least meet the minimum American Avalanche Association standards for a Level 2 avalanche course, which includes the topics covered in all **four required field days**, at least **five of the six classroom days**, and at least a **70% average score** on the skills and projects. You must be there for the session where we fill out the liability release, insurance, and medical forms, and plan the trip logistics. Arrange your schedule now to keep the required times free. If you get sick or have to work, we are sympathetic, but you will not have completed the requirements and we cannot pass you.

Attendance is graded pass-fail. You need to attend all the required field sessions and at least five of the six classroom days in order to pass.

Outdoor Studies Students - Additional Requirements for Letter Grading

We have to give a letter grade for the ODS students. We will emphasize leadership skills in those areas we evaluate. We will grade with equal weighting on the

1. written forecast

2. field observations writeup
3. picking and evaluating good ascent routes
4. picking and evaluating good descent routes
5. finding suitable test slopes
6. identifying and avoiding high consequence terrain.

We may add some graded exercises to the fourth field day.

We have dropped the requirement that ODS students do an independent study project because in the two-week format our time is short, but we still encourage you to do them if you can. There are lots of possible projects, research topics, experiments, and studies you can choose from. Check with me and we will set it up. I have many ideas, and will help you pick a good fit for your interests. I will be happy to coach and advise you through the project, but it is your responsibility to ask for help, as you need it. We encourage group projects and collaboration.

Credentials - Same as Level 1

Everyone who successfully completes the course gets a card that certifies course completion. This course meets and exceeds the American Avalanche Association standards and our cards satisfy training requirements for most employers, insurance companies, and agencies except for Canada, where credentials from other countries are not accepted.

Conferences - Same as Level 1

If you have anything to discuss, grab me after class, or give me a call, or send me an e-mail, and we can set up a time.

Late Assignment Policy - Same as Level 1

Most of our exercises and assignments are designed to be completed on the day we do them in class. Independent projects are due for presentation at the last regular class session.

Registration and Withdrawal Policy - Same as Level 1

Those who show up for the first class session will be given a place in the class, up to our limit. If there are people on the wait list who show up and you are registered but are not there, they will get your spot. You may withdraw anytime before the last official withdraw date for this semester without penalty.

Units - Same as Level 1

The American Avalanche Association guidelines recommend use of the metric system because it is by far the easiest system to use for snow measurement, and it allows us to communicate with workers from other countries.

It is so easy that we are surprised that the US has still not officially changed over. For the metrically challenged, the Units page of the Education section of the AAS website has a number of helpful hints. We will try to offer translation, but will be using metric units as our primary measurement system.

Sources - Same as Level 1

If there is any way they can do it, most shops will give a price break on avalanche gear if you order with a group of friends and prepay. We urge you to support your local shops.

If you are having a hard time affording good field clothing, check the secondhand stores. Juneau is a wealthy town, and many very usable fleece and shell garments find their way to them. Also see what you can borrow from your friends, we only have a few field days per course.

In Juneau, Foggy Mountain Shop, Gravity Plan, and Outdoor Headquarters have stocked at least some avalanche gear and can order items they do not stock. Little Bear snowshoes are hard to find locally, but can be ordered online. (Small snowshoes, inexpensive and functional. Get the ones with the aluminum traction pegs.) Foggy Mountain will check their copy of the video *Winning the Avalanche Game* out for home viewing. Other shops may do the same.

The Alaska Avalanche School in Anchorage, 907-345-0878, carries a full range of avalanche gear and textbooks at good prices, and offers very good courses based out of Southcentral Alaska.

Alaska Avalanche Specialists, 907-523-8900, (full conflict of interest disclosure: my business) sells G3 avalanche gear (probes, shovels, Rutschblock cords), AAS avalanche fieldbooks and pages, and related gear like G3 skis, bindings, and skins, and Ozone snow and water kites.

The Alaska Mountain Safety Center in Anchorage, 907-345-3566, is the bulk source for the text Snow Sense, and does avalanche hazard management consulting and custom training of very high quality.

The UAS Bookstore should have all the texts and supplies for our UAS courses. Books can also be ordered from your local bookstore, and there is a list of avalanche videos and sources on the National Avalanche Center website.

A number of out-of-state online sources now have avalanche gear, but prices are often as good in-state, and we build a better community when we support our local businesses.

Student Rating of Instruction

During the last three weeks of the course, you can rate it online. Notification is sent to your UAS e-mail account when the questionnaires become available. Pleas help us improve our courses by taking a few minutes to fill out the rating forms!

Course Goals - When you finish this course, you should

Understand the role of the leader in avalanche work.

Know the basics of evaluating “scene safety”.

Know how to organize and lead a backcountry rescue from start to finish.

Know how to teach someone to use a beacon and work in a probe line, and understand the theory of how search methods operate.

Be able to do and teach multiple beacon search.

Be able to evaluate the hazards and consequences of travel in advanced terrain.

Be able to pick the lowest-risk routes through advanced terrain.

Be able to manage risk in your travel procedures and decision-making in advanced terrain.

Know how to minimize consequences if you are caught.

Understand how to use fracture mechanics and snow mechanics principles in avalanche forecasting.

Understand how to use snow metamorphism principles in avalanche forecasting.

Understand the limitations of snow stability evaluation and avalanche forecasting.

Know how to do the key field snow observations and read clues to snow stability.

Be able to identify key snow grain types and pick out and record layers in the field for snow profiles.

Be throughly familiar with the key snow tests, their interpretation, and limitations.

Be able to keep useful field notes and weather records, and be able to communicate that information clearly to others, including those without specialized avalanche training.

Understand the basics of mountain weather and how to use weather forecasting tools in preparing a basic avalanche forecast.

Be able to use field observations to evaluate snowpack stability at a basic level, and make appropriate decisions based on that evaluation, while recognizing the inherent limitations of the accuracy of stability evaluation and avalanche forecasting.

Be able to combine weather, avalanche, and snowpack information to do a basic avalanche danger level forecast.

Understand avalanche fracture, release, and dynamics at an introductory level.

Be familiar with the current major topics in avalanche research.

Understand leadership issues and risk management in group decision-making.

Understand how to pursue and conduct field studies to further your practical education.