



EXHIBIT 2

Professional Avalanche Training 1 Guidelines and Proficiencies

American Avalanche Association Professional Avalanche Training 1 Guidelines and Proficiencies

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Mission Statement: This course is a professional level training designed for avalanche workers early in their careers or for experienced workers looking to stay current with industry standards. Workers are prepared to be a contributing member of a risk management team, a skilled observer, and able to manage their small team in avalanche terrain.

1.0 Introduction: This document contains the guidelines set by the American Avalanche Association (A3) for standard proficiencies and marking strategies for the Professional Avalanche Training 1 (Pro 1) course. The following guidelines are intended to provide commonality of training and evaluation in professional avalanche education in the United States. Questions on the contents of this document can be addressed to A3's Professional Training Coordinator.

2.0 Pro 1 Structure and Requirements

Course Length: Minimum 5 days. A3 does not assign a specific number of hours to each course. Pro 1 skills and proficiencies are performed primarily in field-based settings. Course length and instructional hours, both non-field and field-based, should reflect appropriate opportunities for sufficient in-person interactive instruction, including demonstration, practice, coaching, and evaluation.

Course content should include instructional delivery addressing all learning outcomes outlined in Table 1. All marking categories listed in Table 4 need to be addressed and assessment principles in Table 2-3 applied.

Pro courses utilizing online instructional methods shall fulfill existing A3 requirements for course length. Both synchronous and asynchronous online instruction should be quantified to fulfill the analogous requirements for classroom instruction, thereby fulfilling or exceeding Pro course length requirements.

Synchronous instruction hours are based on the average amount of time to deliver and facilitate lesson engagement. Asynchronous student engagement hours are based on the average amount of time a student would take to complete the learning activity such as watching a video, reading material, taking a quiz, or completing a homework assignment.

Formative assessment, feedback, coaching, and mentorship are integrated in A3 professional training programs to support achievement of student learning outcomes. An engaged, interactive learning environment, with access to guidance by a variety of instructor team members, both in the field and didactic classroom setting, is considered integral to Pro courses. (Addressed in Table 2-3 Assessment Principles.)

Online delivery can replace in person delivery of didactic content, when check-for-understanding activities, discussions, interactive exercises and other opportunities for engagement with instructors and other students are included.

Daily briefings and debriefings can be done in the classroom, in a synchronous online setting or in the field, with the engagement of and supervision by instructors.

Skills evaluation such as weather station observations, snow profile and snowpack tests, traveling safely over terrain, communicating risk, and avalanche rescue are, by nature, field evaluations and can be conducted entirely outside. Online engagement opportunities in these subjects, to supplement field-based learning, is also encouraged.

Course Providers: All Pro 1 Courses must be taught by an A3 Pro Course provider. See A3's *Structure and Oversight* document for information on becoming an approved provider.

Course Trainers: All courses will be staffed with at least one A3 Lead Trainer and additional Course Trainers as needed to maintain appropriate student-to-instructor ratio. For pro trainer qualifications see A3's *Structure and Oversight* document.

Student: Instructor Ratio: Six students to one instructor. Student to instructor ratios should be maintained in both field and didactic learning environments. In classroom and online settings, an individual instructor may present or facilitate material. Best practices should be followed to ensure remaining instructors are available to students for feedback, coaching, and facilitation of learning opportunities throughout the course, both indoors and in the field.



Student Cohorts and Student to Instructor Ratios:

For the purposes of A3 Pro Courses, a student cohort is defined as a group of students enrolled in the same course unit, at the required student to instructor ratio. Required student to instructor ratios should be met for the student cohort throughout the entirety of the course to provide appropriate opportunities for student to instructor interaction. A3 recommends the student to instructor ratio is provided for in both synchronous and asynchronous delivery.

Student-Instructor Interaction: Asynchronous and online learning can complement, but not entirely replace, instructor to student contact time when working with didactic or classroom material. Appropriate contact time and interaction with instructors, providing opportunities for regular feedback about learner progress, during asynchronous learning is recommended. Interaction is provided to facilitate continuous applied learning. This includes adequate practice time for students to implement the use of didactic material to both the classroom and the field setting with instructors present. Best practices should be followed to ensure opportunity for student to instructor interactions and contact time in formative assessments, ongoing feedback and coaching, and summative assessments and exams performed in online settings.

Continuity of Instructor Team: To promote continuity of ongoing feedback, coaching and developmental assessment, A3 recommends maintenance of a consistent instructor team cohort with a student cohort throughout classroom, online, and field instruction.

Course Delivery Timeline: Total course delivery time should fulfill Pro Program requirements. The broader timeline within which that course delivery may occur can vary.

- Discrete unit courses: A3 recommends the entirety of a program be delivered in a continuous course format or asynchronously within one season. Other recommendations for Student Cohorts, Student to Instructor Ratio and Interaction, Continuity of Instructor Team, and Course Length and Instructional Hours apply.
- Pro 1- NAS classroom programs: A3 recommends completion of the field component within 2 winter seasons. In a limited number of special circumstances, where the student is a working professional, allowances can be made for the field component completion within a later season, at the discretion of the provider. Other recommendations for Student Cohorts, Student to Instructor Ratio and Interaction, Continuity of Instructor Team, and Course Length and Instructional Hours apply, to the extent possible within the current contract relationship. *Online and classroom instructional delivery recommendations will be readdressed for this program in 2022.*
- Long format college programs (quarter, semester, or year): A3 recommends following current (2021-22) frameworks. Other recommendations for Student Cohorts, Student to Instructor Ratio and Interaction, Continuity of Instructor Team, and Course Length and Instructional Hours apply.

Online Educational Delivery in the Case of Hazardous Weather and/or Conditions:

In the case that unusually hazardous weather or conditions threaten course delivery, online delivery of classroom or didactic material can be used for non-field components. Required field components cannot be replaced with online delivery. The recommendations included in this document can be used for online classroom components. This has traditionally been an option and continues to be so. A3 recommends that course providers prepare educational materials and delivery methods to utilize in the case that a course needs to adapt to hazardous weather and/or conditions. In the case that inadequate field time is achievable, A3 recommends development and communication of appropriate cancellation policies to students in advance of the course.

Student Requirements for Enrollment

1) Course applicants have completed both the following A3-recognized courses prior to enrollment:

- a) Recreational Level 1 Avalanche Training
- b) Avalanche Rescue

Applicants who believe they have the educational equivalent of the above-listed prerequisites can apply to the Pro Course Provider of their choice for a Prior Learning Assessment (PLA) review. Course enrollment in these situations is at the discretion of the Pro Course Provider.

2) One winter season (20 days or more) of relevant experience (demonstrated through **one of the following**).

- c) Prior avalanche work experience; **OR**
- d) A supervised unpaid work internship in the guiding/avalanche industry supported by a letter of reference; **OR**
- e) Letter of recommendation from A3 Professional Member; **OR**
- f) A3 Membership (Affiliate or Professional); **OR**
- g) Winter backcountry travel experience supported by documented trip planning and recorded field observations that contributed to avalanche hazard assessment and personal avalanche risk management.

Recommended Steps for Enrollment: Recreational Level 2 Avalanche Training



Learning Outcomes/Student Proficiencies: See Section 3.0 Pro 1 Learning Outcomes and Proficiencies, Table 1: Pro 1 Student Skills and Proficiencies

Marking and Evaluation: 70% total marks are required to pass the course. Specific categories requiring a “categorical pass” of 70% to pass the course include: station weather observations, snow profiles and snowpack tests, and the written exam. Tables 2 through 13 address student assessment principles, marking categories, criteria, and rubrics.

Pro 1 – NAS Designation: A student who successfully completes the National Avalanche School (both classroom and field sessions) OR the NAS classroom session plus any Pro 1 course will receive the “Pro 1 – NAS” designation, signifying that the student has completed the NAS classroom session as part of their training. A3 classifies Pro 1 – NAS as equivalent to the Pro 1 course.

3.0 Pro 1 Learning Outcomes and Proficiencies

Table 1: Pro 1 Student Skills and Proficiencies

Skill	Proficiencies			
Observe, record and evaluate weather data*	Conduct study plot weather observations using SWAG methods. Record using a time/subject tabular recording format.	Conduct and record field weather and surface snow observations and guidelines.	Collect and record digital telemetry data and interpret the quality of the data set.	Identify key information from a week’s data set of telemetry weather data.
Observe, record and evaluate snowpack data*	Conduct a snow (test) profile. Correctly identify important layer and interface characteristics.	Conduct compression test and other relevant small column tests and correctly identify fracture character and shear quality.	Conduct ECT, PST, and/or other relevant large column tests and identify propensity for fracture propagation in the weak layer.	Document snow profile and snowpack test information.
Observe, record and evaluate avalanche occurrence data*	Observe and record avalanche occurrence data.		Apply the avalanche size classification scheme	
Identify, analyze and document avalanche hazard factors	Identify and document the avalanche problem(s) using current weather, snowpack, and avalanche observations. Estimate how the weather forecast may affect the problem(s) during the forecast period. * The terms “avalanche problem” and “avalanche danger” used throughout this document are defined by the Conceptual Model of Avalanche Hazard (Statham, G., Haegeli, P., Greene, E. et al. Nat Hazards (2018) 90: 663. See https://link.springer.com/article/10.1007%2Fs11069-017-3070-5).		Identify the avalanche danger including <i>trend</i> and <i>confidence</i> using a Conceptual Model of Avalanche Hazard.	



Communicate the avalanche risk between team members	Contribute to the team evaluation of hazard and risk factors during AM meetings.	Summarize and communicate location, objective, and relevance of field observations to team members.	Contribute to the PM debrief that reviews the day's risk management and identifies uncertainty and trends.	
Identify and apply strategies to mitigate bias and other challenges to individual and team decisions	Apply AM and PM forms to risk discussions during team safety meetings.	Apply a group decision-making process that seeks the consent of each team member when choosing appropriate routes through hazardous terrain.	Implement and/or review the field communication and rescue response plan.	
Identify and characterize avalanche terrain	Identify avalanche terrain characteristics on maps, photos, and digital resources.	Identify avalanche paths in the field and describe the terrain characteristics that define the start zone, track, and runout.	Identify avalanche paths in the field and link the terrain and weather event characteristics to the expected avalanche problem(s) and frequency (seldom, occasional, frequent) at the specific site.	
Travel safely and effectively over snow in mountainous terrain	During the AM safety meeting, locate the avalanche problem(s) within the terrain, identify terrain to avoid, and select alternate routes.	In the field, identify potentially hazardous areas and select alternate routes. Select appropriate test slopes.	In the field, identify start zone trigger points; estimate avalanche width, length, and destructive potential.	In the field, demonstrate group management that considers the avalanche problem(s) and manages exposure, vulnerability, and consequence.
Demonstrate a basic knowledge of avalanche formation and release	Demonstrates a basic understanding of weak layer characteristics and formation including: grain type, metamorphism, and persistence.	Demonstrates basic understanding of slab properties and how they influence avalanche release.	Relates weak layer characteristics and slab properties with the correct avalanche character.	
Demonstrate solo avalanche rescue response	Appropriately assess the potential risks of an avalanche incident scene.	Assess avalanche accident scenario and apply appropriate rescue methods based on available resources	Demonstrate competency as a solo rescuer by completing an avalanche rescue scenario to a determined standard.	

*All snow, weather and avalanche observations are conducted to the methods lined out in the SNOW, WEATHER, AND AVALANCHES (SWAG): Observation Guidelines for Avalanche Programs in the United States. 4th Edition, published 2022.

References Cited:

McClung, Schaerer (2006), *The Avalanche Handbook*, Seattle, WA. The Mountaineers Books



American Avalanche Association (2016), *Snow, Weather and Avalanches: Observation Guidelines to Avalanche Programs in the US, 3rd Edition*, Victor, ID.

4.0 Pro 1 Student Evaluation

4.1 Assessment Principles

Table 2: Student Assessment Principles for Professional Course Providers.

1. Marks are derived from assigned tasks. Students are informed of instructor expectations and the nature of course assignments prior to the course start date to facilitate student preparation.
2. Assigned tasks are evaluated after each student has received adequate instruction, coached application, and constructive feedback on that task. Student self-evaluation is encouraged throughout the learning process.
3. The marking assignments reflect the course goals and learning outcomes and are scheduled to facilitate learning and coached application.
4. Combined oral and written responses ensure that oral communication, literacy, and knowledge are evaluated.
5. 70% total marks are required to pass the course. In addition, several specific categories require a “categorical pass” of 70% to pass the course. Retest options are described in the marking scheme. Student can only retest in up to two categories (the written test and one field-based category).
6. Each student will be evaluated by a minimum of two assessors. A course provider will strive to avoid conflicts of interest in evaluating students. Any concerns or complaints about unfair assessments will be directed to A3 for review.
7. Students receive a written performance assessment in a timely manner following the course conclusion. The written evaluation represents the combined opinion of all instructors and informs the student of the following:
 - a. Course outcome: pass or fail. A certificate is awarded to successful students.
 - b. A topical analysis of course marks and feedback on areas where the student performed successfully, and areas that require improvement.
 - c. Options for unsuccessful students.
8. Each student is informed of and provided with the option of appealing his or her marks.

Table 3: Assessment Principles in Online or Hybrid Setting.

1. Due diligence should be maintained to ensure that students work individually during written exams and exam activities performed in an online setting. Appropriate technology should be employed to secure standardized test materials. Information about examination procedures is provided to students in advance of the course. Options and processes for reexamination of relevant components should be included.
2. Pro Course proficiencies that receive marks by written assignments and exams, completed by students individually, can be submitted in person or in a digital format online. Proficiencies that receive marks by student-to-student interaction require presence by an instructor team member to observe.
3. Reasonable accommodations for online participation and testing should be available to students with identified learning disabilities. Information describing opportunities for reasonable accommodations should be provided to students prior to the course. See A3’s Pro Training Reasonable Accommodations document for further examples and resources.

4.2 Assessment Guidelines in Online or Hybrid Setting.

Category 1: Avalanche Rescue Skills

- **Solo Rescue:** Activity and examination occurs in the field.

Category 2: Observation and Recording

- **Documentation:** Activity occurs in field and classroom. The examined documentation can be captured/reviewed in field, classroom, or with online digital submission (photos of field book, worksheets, etc.).
- **Station Weather Observations, Snow Profile Observations, and Snowpack Tests:** Activity occurs in field. Additional instruction can occur in classroom or online environment. Examined procedures are marked or recorded in field (photos, video, notes). The examined documentation can be captured/reviewed in field, classroom, or with online digital submission (photos of field book, handouts, etc.).



- **Avalanche Occurrence Observations** and **Field Avalanche Path Identification Exercise**: Ideally occurs primarily in field. Additional instruction can occur in classroom or online environment. Examination can be supplemented in classroom or online, using past event or terrain materials (photos, maps, field report, etc.). Examined exercises can be captured/reviewed in field, classroom, or online digital submission (photos of field book, worksheets, etc.).

Category 3: Hazard and Risk Analysis

- **Hazard and Risk Analysis Forms** and **Contribution to Daily Hazard/Risk Discussion**: Activity and completion of documentation can occur in field, classroom, or online environment. Discussion must be synchronous, with instructor present for facilitation and observation.
- **Field Situational Awareness/Communication**: Occurs primarily in field. Can be complemented in classroom or online discussion, with instructor present for facilitation and observation.
- **Identify and Characterize Avalanche Terrain** and **Terrain Management**: Ideally occurs primarily in field. Additional instruction can occur in classroom or online environment. Examination can be supplemented in classroom or online, using past event or terrain materials (photos, maps, field report, etc.). Examined exercises can be captured/reviewed in field, classroom, or online digital submission (photos of field book, worksheets, etc.).

Category 4: Written Exam and Knowledge

- **Written Exam**: Occurs in classroom or online setting.

4.3 Marking Categories: The skills and proficiencies listed in Table 1 have been divided into four marking categories: one is pass/fail and the three remaining total 100 percent: 1) Avalanche Rescue Skills (pass/fail), 2) Observation and Recording (40%), 3) Hazard and Risk Analysis (40%), and 4) Knowledge (20%).

Table 4: Marking Categories 1 - 4

Marks	Category 1: Avalanche Rescue Skills (Pass/Fail)	
Pass/Fail	<p>Solo Rescue (one rescuer who is being evaluated)</p> <ul style="list-style-type: none"> ○ 50m x 50m area ○ 2 beacons buried in large backpacks ○ Burial depths of up to 1m <p>Locate and bring to surface both beacons in less than 7 minutes.</p>	<ul style="list-style-type: none"> ○ Successful completion of this portion of the evaluation is mandatory for successful completion of the course. ○ One retest of the solo rescue evaluation is allowed during the course. Timing of retest during the course is at the discretion of the course provider, but successful completion of the Avalanche Rescue Skills evaluation must be complete prior to being awarded a Pro 1 certification.

Marks	Category 2: Observation and Recording (40% of the course mark)	
5	<p>Documentation:</p> <ul style="list-style-type: none"> ○ Field book must be: 1) Neat, 2) Complete, 3) Relevant, 4) Consistent ○ Deduct 1 mark for errors. 	
5	<p>Station Weather Observations</p> <ul style="list-style-type: none"> ○ Techniques with measurement and observations ○ Obtains accurate values ○ Uses correct notation or symbols ○ Understands when to reset ○ Understands the significance of each measurement ○ Recognizes anomalous values 	<p>70% is required in Station Weather Observations to pass course.</p> <p>Option for retest on same day.</p> <p>Only one retest per-student is allowed in this category.</p>



10	<p>Snow Profile Observations</p> <ul style="list-style-type: none"> o Site selection, site description, weather - relevant to primary concern (1) o Air, Snow Temps (1) o Craftsmanship (1) o Layer/interface properties (5) o Uses correct notation or symbols (1) o Profile recording (1) o Test profile observing surface form, slab and weak layer properties. o Identify important layer and interface characteristics (from surface to greater than 15cm below layer of concern) use snow profile checklist/ Structural Indices to prioritize weak layers and interfaces. o Failure to identify the obvious primary weak layer <i>will</i> result in failing this category. 	<p>70% is required in both Snow Profile Observations <i>and</i> Snowpack Tests to pass course.</p> <p>Option for retest:</p> <ul style="list-style-type: none"> • After 14 days. • Complete 3 profiles prior to re-examination. • Approved evaluator. • Profile & tests are considered one exercise. • Only one retest per student in this category.
10	<p>Snowpack Tests</p> <p>Small column tests</p> <ul style="list-style-type: none"> o Includes fracture character and shear quality. <p>Large column tests</p> <ul style="list-style-type: none"> o Includes identifying propagation propensity. 	
5	<p>Avalanche Occurrence Observations</p> <ul style="list-style-type: none"> o Includes path observations and description of event. o Include operational and backcountry events. Differentiate between reporting an occurrence, summarizing an avalanche event, and reporting an involvement. 	
5	<p>Field Avalanche Path Identification Exercise</p> <p>Identify avalanche terrain characteristics:</p> <ul style="list-style-type: none"> o On maps, photos, and digital resources; o That define the start zone, track, and runout; o Link the terrain and weather event characteristics to the expected avalanche problem(s) and frequency (seldom, occasional, frequent) at the specific site. 	
40	Must attain 70% marks to pass Observation and Recording category.	

Marks	Category 3: Hazard and Risk Analysis (40% of the course mark)	
10	<p>Hazard and Risk Analysis Forms-</p> <p><i>AM form (5)</i></p> <p><i>PM form (5)</i></p> <ul style="list-style-type: none"> o Forms are individually completed for evaluation. o AM forms include evaluation of evidence, uncertainty, trend, and identifies gaps in knowledge. o PM form includes field obs. summary, danger rating, and risk management debriefing questions. 	<p>No retest for any exercise within the Hazard and Risk Analysis category.</p> <p>Student analysis of hazard and risk is based on observations, group discussions, group decision and choices in field from the length of the course.</p>
5	<p>Contribution to Daily Hazard/Risk Discussion</p> <ul style="list-style-type: none"> o Student contribution to small group AM/PM hazard and risk discussions. 	
5	<p>Field Situational Awareness/Communication</p> <ul style="list-style-type: none"> o Performs appropriate formal/informal tests (1) o Accurately communicates observations from test pits (2) o Can convey the significance of their profile results to the snowpack, weather and avalanche observations. Can apply this to confirm their travel plan. (2) 	<p>No retest for these 3 sections. The evaluation of communication, student travel skills and terrain identification skills are dependent on weather and conditions.</p>
10	<p>Identify and Characterize Avalanche Terrain</p>	



	<ul style="list-style-type: none">o Clearly identify avalanche paths, potential and frequency (2)o Connect avalanche problem to terrain (2)o How to mitigate the problem (avoid by picking a new route or engage by ski cutting/placing a shot, etc.) (2)o Demonstrate understanding of the complexity and consequences of your plan (4)	Each student is evaluated under the same conditions, but course-to-course variation is likely. The student must pass this category to pass the course.
10	Terrain Management <ul style="list-style-type: none">o Terrain Selection (2)o Hazard Identification (2)o Group Management and Leadership (2)o Risk Management and Decision Making (4)	
40	Must attain 70% marks to pass Hazard and Risk Analysis category.	

Marks	Category 4: Written Exam and Knowledge (20% of course mark)	
20	Written exam	70% on the written exam is required to pass course. Retest allowed after 14 days.



5.0 Instructor Marking Rubrics and Guidelines for Applying Marks

5.1 Avalanche Rescue Skills (Pass/Fail)

Table 5: Avalanche Rescue Skills Marking Rubric (Pass/Fail)

Mark	Description
Pass	Student locates, recovers, and brings to surface two beacons in less than seven minutes.
Fail	Student fails to locate, recover, and bring to surface two beacons in less than seven minutes.

5.2 Observation and Recording (40% of course mark)

Table 6: Documentation Marking Rubric - Field Books (5 Marks)

	Description
Exceeds Standard 4-5 (>80%)	Student's documentation is neat and complete. All fields are appropriately filled in including nil, null, and N/O values. Documents are easy to interpret and require little follow-up questions to the student.
At Standard 3.5 (70%)	Student's documentation is generally neat. Student may be missing an occasional piece of data and/or inappropriately used nil, null, and N/O values. Documents require several questions to the student to provide interpretation. Documents are useable by a supervisor
Below Standard <3.5 (<70%)	Student's documentation is generally messy, incomplete, and requires multiple questions to the student for interpretation. The documents are generally unusable by a supervisor. Data is missing and/or unreadable.

Manual Weather Station Observations:

- Student learning outcomes include learning *why* daily station weather observations are essential to operations, *which* observations are most commonly observed, and *how* to conduct and record the observations using SWAG guidelines.
- The course study plot site should be in a realistic location that provides data relevant to the daily hazard and risk analysis and discussion. The site should be set up prior to the course to promote undisturbed snow.
- Students should conduct manual weather observations over several days during a course. Opportunities to record weather station data should be sufficient to allow coaching and correction of skills prior to assessment.
- Students record manual weather observations in their notebooks using a subject/date tabular format. This allows students to take the daily information into the field and observe trends over time while in the study plot.
- The manual weather plot should include instrumentation to conduct all observations on the Standard Manual Weather Observation Recording Form
- Measurements may be made in metric units, imperial units, or a blend of each, based upon the course setting and operational objectives.
- Additional automated weather station data is observed and recorded to supplement manual weather observations.
- Students and instructors collaborate to create and maintain a graphic time profile of pertinent weather observations for the course to aid in the identification of temporal trends and impact on the snowpack.

Table 7: Weather Station Observations Marking Rubric (5 Marks)

Mark	Description			
Exceeds Standard 4-5 (>80%)	Conducts measurements and observations using SWAG methods. Requires little or no coaching with techniques.	Obtains accurate values. Understands when to reset.	Understands significance of each measurement. Recognizes anomalous values	Notebook is neat, complete, and easy to understand. Uses correct notation or symbol.
At Standard 3.5 (70%)	Makes 3 or fewer minor errors but completes all observations.	Forgets to reset but performs the task accurately once reminded.	Misses anomalous values.	Notebook is messy, eraser smears, numbers or symbols hard to read.



Below Standard <3.5 (<70%)	Makes 4 or more minor errors or more than one major error. Major errors include: forgets to measure new snow or water equivalent, misses a persistent grain type on snow surface, or incorrectly calculates settlement.	Values are incorrect and of no use to the forecaster; or requires excessive coaching to perform observation to SWAG standard.	Requires repeated prompting to understand significance of a measurement. Cannot accurately perform a measurement after prompting.	Notebook is unreadable.
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Sample Manual Weather Observation Recording Form

STATION WEATHER OBSERVATIONS: <i>General Description of Region and Operation</i>						
LOCATION: (i.e., name, elevation, treeline reference, etc.)	Example: Mid Plot 8743'					
Date	20150201	20150201	20150202	20150202	20150203	20150203
Time	1130					
Sky	OVC					
Precipitation Type and Rate	S-1					
Temperature Max °C /F	-1.0					
Temperature Min °C /F	-5.5					
Temperature Pres °C /F	-5.0					
Surface Temperature °C /F	-5.0					
Temperature 20 °C /F	-3.5					
H2D cm /in	5					
HSTW mm /in	4					
HST cm /in	18					
<i>Additional Boards may be added to meet venues format including SWE measurements</i>						
HS cm /in	103					
Foot Pen. cm	35					
Surface Form, Size mm	SH, 3.0					
Wind Speed/Direction	L/ N					
Blowing Snow	U					
Comments	Flurries started 0400 hrs. est.					



(Comments may include information about snowfall intensity, durations, surface crust thickness, etc.)

Table 8: Snow Profile and Snowpack Test Observations Marking Criteria (20 Marks)

Mark	Topic	Description
1	Site Selection and Description	<ul style="list-style-type: none"> o Instructors choose the general exam location, but students are required to select their individual site. Sites should be probed prior to digging to ensure the site provides relevant information. o Examiners will provide 15 min. warnings to ensure the students are on time. o Students are allowed to dig in teams of two to reduce the strenuous nature of the initial excavation. o Snow profile exams require a student to conduct a test profile targeting the avalanche problem that has been discussed during the course. o All measurements and techniques should be conducted to SWAG standards. o Students may work with a partner to cut columns for large column test. o Instructors need to see each student conduct at least one test. Extra time may be allotted if a delay occurs while the instructors are observing another student's snowpack test.
1	Air and Snow Temps	
1	Craftsmanship	
5	Layer/Interface Properties (Depth, Hardness, Grain Type/Size, Moisture)	
1	Uses Correct Notation	
1	Profile Recording	

Mark	Topic	Description
5	Small Column Test: Compression Test	<ul style="list-style-type: none"> o Conducts small column tests to SWAG standards. o Uses CT to confirm layer ID in profile. o Correctly identifies fracture character/shear quality.
5	Large Column Test: ECT and/or PST	<ul style="list-style-type: none"> o Conducts large column tests using SWAG methods. o Identifies propensity for crack propagation and correctly relates findings to layers identified in profile.

Table 9: Timing Allocation for Snow Profile and Snowpack Tests

Observation	Time
Excavate from surface 15cm below layer of concern	
Site selection, site description, notebook page headers	10
Temperature profile (Tair, Tsurf, T10 down to T40 as a minimum)	10
Layer ID: Slab characteristics; Weak layer/Interface characteristics	20
CT x 1	20
ECT x 1	
PST x 1 (if there is ECTN results, students need to verbalize decision-making and perform test to show competency)	
Total Time Estimate (not including excavation)	60 minutes

Table 10: Snow Profile (10 Marks) and Snowpack Tests (10 Marks) Marking Rubrics

Marks	Description					
Profile (10)	Site Selection and Description (1)	Air and Snow Temps (1)	Craftsmanship (1)	Layer/Interface Properties (Depth, Hardness, Grain Type/Size, Moisture) (5)	Uses Correct Notation (1)	Profile Recording (1)



Exceeds Standard 8-10 (>80%)	Probes prior to digging. Site description informative. Clearly understands objective and digs to at least 15cm below layer of concern. Profile walls are clean and straight, careful not to disturb weak layer. Correctly identifies structural properties of slab, key layers/interfaces. Student can accurately describe and track layers by the date buried (i.e., the Jan. 13th HST, the Feb. 20th V, the MLK MF cr).
At Standard 7-7.5 (>70%)	Uses excessive time but information is good quality. No more than three minor errors. Example: incomplete site description, did not probe enough prior to digging, profile too small, rough profile walls, improper shading of thermometers, does not record surface form. Carelessness with structural indices results in missed grain size or hardness difference and misses one of several less important weak layers. Sloppy craftsmanship-- but finds most important snowpack characteristics.
Below Standard <7 (<70%)	Four or more minor errors (see above). Failure to correctly identify obvious primary weak layer results in failure of this category

Marks	Description	
Snowpack Test (10)	Small Column Test: Compression Test (5)	Large Column Test: ECT and/or PST (5)
Exceeds Standard 8-10 (>80%)	Conducts small column tests to SWAG standards. Uses CT to confirm layer ID in profile. Correctly identifies fracture character/shear quality.	Conducts ECT and/or PST using SWAG methods. Identifies propensity for crack propagation and correctly relates findings to layers identified in profile.
At Standard 7-7.5 (>70%)	Did not correctly ID fracture character. Could not relate the layer ID in column test to profile wall.	Poor craftsmanship but acquires key information
Below Standard <7 (<70%)	Missed or did not observe sudden fractures. Poor technique (tapering column), inconsistent taps.	Poor craftsmanship or observation results in missed information.

5.3 Hazard and Risk Analysis (40% of course mark)

PRO 1 emphasis: Student's ability to summarize and communicate daily observations, contribute to the small group risk management decisions, and manage their own risk.

- a) This category must be passed with a grade of 70% or higher to pass the course. No re-test options are available. This category evaluates the student's ability to apply the hazard and risk factors to decisions, to incorporate a group decision-making process, and requires the student to form opinions and to contribute to group discussions and meetings. Therefore, the only recourse for a grade of less than 70% is to retake the course in the group setting.
- b) Throughout the course students strive to conduct twice daily safety meetings incorporating the use of AM/PM risk management forms. Students are required to individually fill out forms that are collected for final evaluation.
- c) Hazard and Risk Analysis Forms: At the Pro 1 standard, emphasis is given to the student's ability to summarize and document observations rather than provide a forecast.
- d) Student Contribution to AM and PM meetings: Instructors should pay close attention to student participation and leadership, and apply a mark to each student's contribution to the AM and PM safety meeting.
- e) Field Situational Awareness: Encourage the use of simple checklists, self-reflective questioning, and/or group discussions to identify changing conditions and hazards in the field. This should include an evaluation of exposure, vulnerability, and consequences to current and anticipated hazards.
- f) Communication: Students can clearly communicate observations and implications within their group, to adjunct field teams, and/or to a base of operations.
- g) Identify and Characterize Avalanche Terrain: Students clearly identify avalanche paths, their maximum potential, and can describe their general frequency.
- h) Terrain Management: Students must pass this section (70%) to pass the Hazard and Risk Analysis category.



The student needs the skills to manage his or her personal and partner’s risk in avalanche terrain with previous education from their Level 1 and personal experience. *The evaluator* should strive to place him or herself back in time to the entry-to-work level. What skills did I require to identify avalanche terrain, choose safer routes, and apply a safety factor in the decision-making process?

Table 11: AM & PM Forms Marking Rubrics (10 Marks)

Marks	Description
0.5	Accurately observe and record today’s critical weather factors.
0.5	Accurately identify today’s critical hazard factors including describing the avalanche problem(s) in the order of concern.
1	Accurately describe any uncertainty (gaps in knowledge) and propose tests and observations that fill that gap.
1	Rate today’s hazard, hazard trend, and confidence in your forecast.
2	Accurately describe specific terrain features or runs the group should avoid given today’s avalanche problem.
Marks	Description
2	Accurately summarize field weather, snowpack, and avalanche occurrence observations, using standard and non-standard tests, and provide evidence that supports your conclusion about the avalanche problem in the area observed.
1	Accurately summarize the hazard in the area observed, describe the avalanche problem(s) in the order of significance with hazard rating and trend.
2	Summarize how successfully your group managed the risk, where mistakes were made, and what could be improved for tomorrow.

Student Contribution to Meetings Marking Criteria:

Evaluated on Facilitation, Communication and Knowledge over a three-day time frame. Marks are applied at the end of the 3-day period. Consider that students need to “warm up” to role-playing and responsibility. Instructor listens and makes observations about student’s perspective, knowledge, and vocal contribution. Also coaches documentation. Notes are taken throughout. Each student should be in the leadership/facilitation role at least once, and in the recorder/summarizing role at least once. This can be done in teams of two. This is accomplished through both the AM and PM meeting, thus giving each student a chance to be in each role at least once on a five-day course.

Table 12: Student Contribution to Meetings Marking Rubric (5 Marks)

Marks	Description
2	Elicits, listens to, and respects all opinions, ensures all members have a voice, separates fact from assumption.
2	Ensures conclusions about stability and hazard are supported by evidence.
1	Summarizes well. Contributes to key decisions as to less risky paths of travel, respects all opinions and any one person’s veto or uncertainty. Terrain decisions evolve from consensus not from agreement.

Terrain Management Marking Criteria: Must pass this section (minimum 7/10) to pass the Hazard and Risk Analysis Category. The proficiencies include the following abilities:

- a) Select “indicator” slopes that provide the opportunity to gather relevant information and determine conditions during travel. Select appropriate ski testing slopes.
- b) Identify hazardous areas and select alternate routes through the terrain.
- c) Demonstrate group management that demonstrates good habits, appropriate terrain travel, good communication, identifies appropriate regrouping locations, and minimizes exposure to avalanches by drawing safer terrain margins.
- d) Students need to be in the lead and make decisions outside the group environment.



Table 13: Terrain Management Marking Rubric (10 Marks)

Mark	Description
Exceeds Standard 8-10 (>80%)	Leads group through challenging terrain with few or no errors. Conducts group equipment checks prior to departure. Chooses representative sites to gather information to appropriately modify field decisions. Recognizes when conditions create a hazard in non-defined avalanche terrain and applies appropriate route finding to reduce risk. Manages group when appropriate: maintains appropriate terrain margins; provides adequate communication; considers vulnerability and timing, exposes only one person at a time and regroups in non-exposed terrain.
At Standard 7-7.5 (70%)	Has the essential skills described above. Makes minor errors and has the experience to correct the errors before the risk or exposure is serious. Examples of minor errors include: individual fails to conduct a trailhead gear check but checks transceivers soon after and prior to entering avalanche terrain; requires a little coaching with site selection but recognizes when conditions create a hazard in less defined terrain; appropriate route finding but requires coaching when applying a "narrow" safety margin; regroups where exposure is reduced but requires coaching to maintain adequate group communication; identifies exposure and vulnerability but requires some coaching with potential consequences (for example when ski cutting).
Below Standard <7 (<70%)	Does not demonstrate appropriate choices for travel in challenging terrain. Does not adequately error correct to reduce risk or apply a sufficient safety margin when route finding. Several minor errors may combine or a major error may have the potential to compromise group safety. Examples include: inappropriate site selection when information gathering and/or inappropriate application of observations; poor timing with avalanche terrain exposure; inadequate communication to group prior to entering avalanche terrain; fails to recognize exposure/vulnerability and does not reduce risk adequately to group members. Excessive coaching or an intervention is required by the instructor to mitigate risk to the group in avalanche terrain

5.4 Written Exam (20% of course mark)

Table 14: Written Exam Marking Criteria (20 Marks)

Marks	Category 3: Knowledge/Written Exam (20)	
20	<p>Written exam</p> <ul style="list-style-type: none"> o The exam should canvas a selection of topics from the course to provide evaluation of student comprehension, continued learning, and material delivery. o Test should be no more than 50 questions long and take no longer than 1.5 hours on average. o Test should use a variety of techniques (short answer, essay, matching, multiple choice, etc.) to assess student understanding o All tests will be closed book. o Accommodations will be made for students with testing, learning, and reading disabilities to the best of the Course Provider's ability. 	<p>70% in the written exam is required to pass course.</p> <p>Retest permitted after 14 days.</p>