

Course Development Worksheet (7/23/19)

This form is to be maintained for all approved NSP courses and used by instructors leading the course. Some elements are required across all courses so they are not listed here, including course registration and closure, participant completion of an evaluation, IT completion of a QA form, a signed NSP release form by all participants, and use of the conflict resolution process in the NSP Policies & Procedures. Some courses may have local/divisional variants that should be documented elsewhere.

Standard Course Elements:

CERTIFIED MODULE 1 Avalanche

Program/Discipline: **Avalanche Modules (Primary and Advanced) for the Certified Program**

Suggested resources for Primary (use latest publication editions)

- *NSP Level I Course*
- *Snow Sense* by Jill Fredston and Doug Fesler
- *Backcountry Avalanche Safety* by Tony Daffern
- *NSP Backcountry Avalanche Safety: A Level I Summary* by Mike Laney
- *Explosives Use in Avalanche Control*, National Ski Areas Association Guidelines
- *Recommended Safe Working Practices, Orica Avalanche Products*, Orica Mining Services, http://www.oricamining.com/uploads/OUA0229_Avalanche_web.pdf
- *Snow, Weather and Avalanches; Observation Guidelines for Avalanche Programs in the United States (SWAG)* by the American Avalanche Association and USDA Forest Service National Avalanche Center
- *Staying Alive in Avalanche Terrain* by Bruce Tremper
- *The Avalanche Handbook* by David McClung and Peter Schaerer
- www.utahavalanchecenter.com
- www.backcountryaccess.com
- <https://avalanche.state.co.us>

Suggested resources for Advanced (use latest publication editions)

- Resources listed in Primary Avalanche module
- NSP Level II Avalanche course
- NSP Avalanche Rescue Fundamentals by Lin Ballard and Dale Atkins

- NSP Backcountry Avalanche Safety: A Level 1 Summary by Mike Laney

Module Objective - Upon successful completion of this module the candidate will demonstrate thorough knowledge and understanding of avalanche hazard assessment, proper use and storage of equipment, safety procedures, and some general knowledge of mitigation techniques.

The Primary Module objective is established for one being able to venture beyond a Western US resort boundary on a backcountry tour and have Avalanche awareness, rescue techniques, risk factors and some basic knowledge of Avalanche mitigation.

The Advanced Module objective is established for one being a Snow Safety Professional (i.e., employed by a resort, DOE, and/or USFS to perform Avalanche mitigation). This portion is to be used by Western Divisions that actively participate in mitigation and the three-year examination window applies to BOTH Primary and Advanced Avalanche Modules for Candidates. If a Certified member wishes to transfer to a western division, and keep their Certified status, they must complete the advanced Avalanche Modul . These members will be allowed an adequate amount of time to gain experience and knowledge at the discretion of the Division Certified Avalanche Supervisor, but no more than two years. Once a transferring member attempts the Advanced Avalanche modules the first time, they will have two years to successfully complete the module to retain Certified status (the spirit of this rule is to align with the notion of National Certified time constraints while at the same time that Certified Patrollers are self-motivated value creators to the organization).

Module Structure - This module (either the Primary or Advanced) is a three-part evaluation with a suggested total exam time of approximately 3 hours consisting of:

- 1) An indoor written exam consisting of 50 questions from the national test bank. Standard questions covering the required knowledge areas will be asked and the written exam should be no longer than 30 minutes in length.
- 2) An oral interview where an evaluator will ask questions about avalanche risk assessment and mitigation from the national test bank. Standard questions covering the required knowledge areas will be asked and the oral interview should be no longer than 45 minutes in length.
- 3) An on mountain practical or off the hill interview to evaluate the candidate's knowledge of ski area management & risk protocols with a focus on pre- and post-loss mitigation. Suggested exam time 1 hour.

Module Structure:

- a) Venue – Both indoors and outdoors at the discretion of the examiners.
- b) Class size – Candidates will be evaluated individually for a class size of 1.

- c) Instructor/student ratio – Three instructors to one candidate.
- d) Audit frequency – An assigned Instructor Trainer (IT) should audit this module at every exam.

Module Content – Certified candidates must be familiar with the essential knowledge listed later in this document.

Resources Required – In order to understand a candidate's knowledge that accurately represent realistic situations, it is essential the exam interviews take place while the ski area where the exam is being held is open and operating at the time.

- a) Instructors – Referenced above
- b) Helpers – N/A
- c) Equipment: Candidates will be required to have their own avalanche transceiver, avalanche probe, and shovel. They will also be required to have, and be on, ski/snowboard equipment including ski/snowboard boots and/or skis/snowboard. Candidates may be required to ski/ride out to the simulated avalanche deposition zone, mountain conditions permitting. Examiners will supply two (2) avalanche transceivers to be buried (at realistic and different avalanche burial depths) within a 100m x 100m simulated avalanche deposition zone, which will be developed by the examiners.

Instructor Credentials - Primary

- Certified members that have passed this module, or
- Certified members assigned by Division Certified Supervisor or Avalanche Module Lead
- Avalanche professionals recognized and approved by the Certified Avalanche Module Lead or Division Certified Supervisor
- Certified members who have participated at the Certified Exam in an Avalanche Examiner Capacity within the past 3 years. All examiners will attend a Certified Avalanche training/recertification module once every three years.
- Certified members who have not examined in a 3-year period must participate a Certified Avalanche training/recertification module for standards calibration
- Examiner Candidates (Provisional Examiners) will shadow evaluate at either a Certified Pre-Test or Certified Exam to compare scores against qualified Examiners for calibration purposes before being deemed an Avalanche Examiner. Those failing to meet the examining criteria will not be eligible to examine until they meet said criteria. Provisional Examiner scores will NOT be used as part of the final evaluation.

Instructor Credentials - Advanced

- Certified members that hold Avalanche Level II, or
- Certified members that have passed this module, or
- Certified members assigned by Division Certified Supervisor or Certified Module Lead
- Avalanche professionals or Level 2 avalanche Instructors recognized and approved by the

Division Certified Supervisor

- Certified members who have participated at the Certified Exam in an Avalanche Examiner Capacity within the past 3 years. All examiners will attend a Certified Avalanche training/recertification module once every three years.
- Certified member who have not examined in a 3-year period must participate a Certified Avalanche training/recertification module for standards calibration
- Examiner Candidates (Provisional Examiners) will shadow evaluate at either a Certified Pre-Test or Certified Exam to compare scores against qualified Examiners to calibration purposes before being deemed an Avalanche Examiner. Those failing to meet the examining criteria will not be eligible to examine until they meet said criteria. Provisional Examiner scores will NOT be used as part of the final evaluation.

Module requirements – NSP Member, Alpine Patroller Classification

Evaluation Format - The evaluation will consist of a written exam, an oral interview, and on mountain practical session. Candidates will demonstrate a working and educational knowledge of avalanche hazards and mitigation from a macro down to a micro level and be evaluated across a number of operational metrics. The candidate must demonstrate extensive depth of knowledge, critical thinking and creative problem solving across various topics outlined in the Essential Knowledge section below.

Grade Scale/structure – Successful candidates will score equal to or greater than an 80% on the written and oral exams, and will pass (based upon a Pass/Fail criteria) the field portion of module. A passing score is 80% on the written exam is required before moving to an oral interview and practical application. The practical application for the beacon search, is Pass/Fail based on the criteria outlined below.

Reporting Requirements –

- **Class Registration** – On line (follows normal course registration, Divisions have the option of keeping module records locally, but must register the exam if this option is chosen)
- **Course completion** – On line completed by the Division Supervisor
- **Course feedback** – Course evaluation form completed by students
- **Other** – As per local (Division) policy

Risk Management Considerations –

- a. NSP Event/Training Release Form
- b. Local Area Release Form (if needed)

There is an inherent risk involved in all instructional activities. All instructors must provide an environment that will permit anyone who is not comfortable attempting any portion of the

training to elect to not participate in any activity. All participants need to sign an Event/Training release form. A copy of the release forms need to be kept for at least seven years unless division's policy directs differently.

Conflict Resolution Due to the potential for disruption of an orderly process, appeals because someone does not agree with a test score on any education or skill test, while permitted, should be done with the ranking test official on the test day while all the pool of test judges are present. When an appeal is filed because someone does not agree with a test score on any education or skill test after the test has concluded and the test judges have departed, this appeal should be denied unless it can be shown by clear and convincing evidence the test result was not based on program standards but the result was due to clear evidence of bias, prejudice or a violation of the program rules and only then is an appeal to the next highest level warranted. The officer at the next highest level should obtain evidence on the issue from the test judges present during the test along with evidence from the person making the appeal. Otherwise the officer to whom the appeal is made should deny the appeal. Any appeal filed more than thirty days from the date of the test should be denied unless not to grant the appeal would shock the conscious of fair-minded patrollers.

Concluding Objective - Upon successful completion of the Primary Module, the candidate will demonstrate thorough knowledge and understanding of avalanche hazard assessment, proper use and storage of equipment, and safety procedures, and general knowledge of mitigation techniques.

Essential Knowledge - Primary

Knowledge of

- Definition of terms used in avalanche mitigation
- Industry needs for Avalanche mitigation
- Avalanche mitigation problem factors
- Passive methods of mitigation
- Active methods of mitigation
- Avalanche classification

Essential Knowledge of:

- Weather factors
- Self-Rescue/Survival
- Companion Search
- Emergency Medical Care and evacuation of avalanche victims
- The use of avalanche beacon, probe, and shovel, Snowpack factors, Terrain factors Human factors/Group Dynamics, Avalanche release discussion, Hazard assessment discussion, Decision-making discussion

- Demonstrate accurate measurement of:
 - Slope angle
 - Aspect
 - Elevations
- Identify terrain features, including slide paths, terrain traps in the field, and any issues/problems that could potentially occur
- Interpret an Avalanche Forecast, including a Danger Rose, in terms of relative hazard, issues/problems, and determine level of acceptable risk to group
- Make a stability assessment based on a graphical format snow profile
- Discuss a snow profile based on data provided by the examiner
- Discuss terrain clues to identify avalanche paths
- Discuss terrain and snowpack clues to determine direction of prevailing winds and lee slopes
- Discuss basic aspects of:
 - Layer hardness
 - Temperature gradients
 - Grain types
 - Grain sizes
 - Stratigraphy

Avalanche Field

- Given a hypothetical last seen area (LSA) and flow pattern, identify likely burial areas on a given slope
- Find (strike) two transceivers buried in a pack or dummy within a 100 m by 100 m maximum area within five minutes (Critical performance indicator (CPI) – must be passed in order to certify). Both the five-minute criteria and search area can be shortened, but not expanded, at the discretion of the Certified Avalanche Supervisor owing to terrain limitations at the time (in other words, less time to search if the search area is too small).
- Demonstrate effective spot-probing techniques for clues and catchments

Essential Knowledge- Advanced

Knowledge of:

- Avalanche classification
 - Group search – and area protocol
- Organized Search and Rescue (SAR) and Incident Site Command (ISC) system
- Emergency medical care and evacuation of avalanche victims
- Avalanche incident documentation

Essential Knowledge of:

Mitigation:

- Definition of terms used in avalanche mitigation
 - Industry needs for Avalanche mitigation
 - Demonstrate knowledge of types of mitigation techniques
 - Avalanche mitigation problem factors
 - Passive methods of mitigation
 - Active methods of mitigation
 - How to prepare a cap/fuse assembly*
 - How to prepare a hand charge*
 - What to do in the event of a “No Light” or “Dud”*
 - Demonstrate knowledge of some explosives characteristics*
 - Describe how to handle no lights and duds*
 - Demonstrate knowledge of ATFE and any state regulations relating to explosives*
- Demonstrate knowledge of explosive safety procedures

Under **NO circumstances are any explosives or explosives related equipment to be present at this exam. Topics related to explosives are for discussion only.*

Demonstrate effective probe-line management

- Group size
- Spacing (with and without a guide cord)
- Alignment
- Commands
- Use of guide cord
- Marking
- Procedures for potential “strike”
- Offset for second pass
- Describe effective use of resources (probers, shovelers, probe line group leaders, ICS)
- Location
- Dimensions

Test pit Observations/measurements

- Dig a suitable test pit (Some divisions may not be able to test in the field. In that situation the candidate must be able to describe, in detail, how the measurement of test would be conducted, why the test is conducted, and what results could indicate.) and interpret the results
- Perform/demonstrate/describe at least one of the following: Shovel Shear test, Compression test, and/or Extended Column test and interpret the results of each
- Demonstrate/describe (when/where/how they are to be used) effective shoveling methods and techniques including Strategic and Conveyor shoveling
 - Stratigraphy
 - Layer hardness

- Temperature gradients
- Grain types
- Grain sizes
- Critical structures (“red flags”)
- Assess fracture (shear) quality
- Draw a snow profile
- Rapid Response (Hasty) Team deployment
- Scene Management