

ASMSU BASIC AVALANCHE HAZARD EVALUATION

Instructors:

Ron Johnson: Avalanche Specialist, Gallatin National Forest Avalanche Center

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Course format:

Two evening sessions at MSU

- On the first night we will cover avalanches, terrain, weather, and snowpack
- On the second night we will cover human factors, decision making, and rescue

One field session at Bridger Bowl

- Covering snowpack evaluation and avalanche beacon practice

Course requirements:

Evening Sessions:

- the ability to stay awake and a desire to learn about avalanches

Field Session:

- the above.....Plus.....
- basic skiing or boarding skills
- appropriate ski or snowboarding equipment
- retaining devices for skis or snowboard
- warm clothes and footwear
- food and water
- shovel
- avalanche transceiver.....must have one with 457 kHz!
- signed release form

Recommended reading:

Snow sense – Great no nonsense guide; this should be your first avalanche book!

Fredston, Jill A., and Doug Fesler. 1994. Snow sense: a guide to evaluating snow avalanche hazard, 4th ed. Anchorage, Ak: Alaska Mountain Safety Center, Inc., 116 pp.

Staying alive in avalanche terrain – Great information and easy to read

Tremper, Bruce. 2001. Staying alive in avalanche terrain. Seattle, WA: The Mountaineers, 284 pp.

The avalanche handbook – For the more technically inclined

McClung, David, and Peter Schaerer. 1993. The avalanche handbook. Seattle, WA: The Mountaineers, 271 pp.

Reading weather – A great weather primer

Woodmencey, Jim. 1998. Reading Weather. Helena, MT: Falcon Press, 150pp.

The avalanche review – A newspaper geared toward avalanche professionals

A publication of the American Avalanche Association. For subscription information, check AAA at www.avalanche.org

Gallatin National Forest Avalanche Center

Advisory Number.....587-6981
Office Number.....587-6984
Web Address.....www.mtavalanche.com

Other avalanche information on the web

Forest Service Nat'l Avalanche Center – Has some great basic information and tutorials
www.fsavalanche.org

Avalanche.org – For all things avalanche
www.avalanche.org

Cyberspace Snow and Avalanche Center
www.csac.org

Course Outline

Note: This course is based on many of the concepts developed by Fesler and Fredston as presented in the book Snow Sense (listed above in Recommended Reading).

Intro to Avalanches and Avalanche Terrain - Karl

- I. Types of Avalanches
- II. Terms Associated with Avalanches
- III. Terrain: Is the terrain capable of producing an avalanche?
 - a. Slope angle
 - b. Slope size
 - c. Slope shape
 - d. Vegetation
 - e. Slope aspect with respect to:
 - i. Sun
 - ii. Wind
 - f. Elevation
 - g. Using terrain for safe travel

Weather and Snowpack - Ron

- I. Avalanche Physics 101
 - a. Balancing act between stress and strength
- II. Weather – Is the weather affecting the snow stability?
 - a. Precipitation
 - i. Amount
 - ii. Density
 - iii. Rate
 - iv. Type
 - b. Wind
 - i. Direction
 - ii. Velocity

- iii. Duration
 - c. Temperature
- III. Snowpack – Could the snow slide?
 - a. Snowpack layers
 - i. Slab
 - ii. Weak layer
 - iii. Bed surface
 - b. How layers form
 - i. Slabs (wind, bonding, changing crystal types during storms)
 - ii. Weak layers
 - 1. Depth hoar (thin snowpack and/or cold temperatures)
 - 2. Surface hoar (cool, clear nights and calm winds)
 - 3. Changes in crystal types during storms
 - c. Relationship between layers
 - d. Variations in the snowpack on a given slope

Decision-Making and Human Factors - Ron

- I. Are you willing to make a prudent assessment of the avalanche danger?
- II. Assessing the avalanche danger (gathering information and using it wisely!)
 - a. Subjective (What they say)
 - b. Objective (What you observe)
 - i. Recent avalanche activity
 - ii. Cracking and/or collapsing of the snowpack
 - iii. Stability tests
 - c. Assessment (What do you think?)
 - d. Plan (What are you going to do?)
- III. The Ritual (Things to consider before playing on a given slope)
 - a. SOAP
 - b. Equipment
 - i. Avalanche transceiver (457 kHz)
 - ii. Shovel
 - iii. Probe poles
 - c. Avalanche eyeballs
 - d. Partner
 - e. Always think “What if?”
 - f. Only expose one person at a time!

Avalanche Rescue - Karl

- I. What to do if you are caught in an avalanche
 - a. Fight!
 - b. Try to get off the slab
 - c. Swim, try to clear an air pocket, RELAX!
- II. What to do if your partner is caught
 - a. Yell!
 - b. Last seen point, available resources, initial search
 - c. Transceiver search
 - d. Probing