

SMC SNOW, ICE AND GLACIER CLIMBING LEVEL 2 TRAINING COURSE SYLLABUS

SIG 2.1

Reference: Mountaineering: The Freedom of the Hills, 8th Edition, The Mountaineers, Seattle WA

ORIENTATION

Meet and Greet Activity

SIG 2 Learning Objectives

- Build on the foundation of SIG 1
- Add to existing core knowledge
- Learn technical skills for intermediate terrain
- Cultivate expedition behavior (p. 470)

SAFETY AND OVERVIEW

Managing Risk (p. 485-494)

- Make good decisions (p. 492-494)
- Experience and judgment (p.15, 486)

SNOW, ICE AND GLACIER CLIMBING ARENA

Alpine Topography and Understanding (p. 352-353)

- Snow or Ice Couloirs: advantages and disadvantages (p. 355)
- Snow or Ice Faces: advantages and disadvantages
- Snow or Ice Ridges and Buttresses: advantages and disadvantages (p. 354)
- Cornice awareness and avoidance (p. 354)
- Avalanche awareness and avoidance (p. 356-367)

Glacial Topography, Understanding and Hazards (p. 376)

- Definition, formation and characteristics of a glacier (p. 547-548)
- Tension and compression (p. 377)
- Ablation and Accumulation Zones
- Glacial routes: advantages and disadvantages
- Crevasses and snow bridges
- Bergschrund and moat (p. 378)
- Moraines (p.378)

- Meltwater, whiteouts, rockfall (p. 378)

EFFECTIVE GLACIER TEAM TRAVEL

- Tie in using Butterfly or Figure 8 on a bight (p. 382)
- Decide whether to pre-place prusiks or use stopper knots (p. 383)
- Order climbers according to skill and ability
- Learn to predict and detect crevasses (p. 384-386)
- Either step over or end run crevasses (p. 385-388)
- Belay crossings or climbing when necessary
- Anticipate teammates movement and maintain appropriate tension and attention (P. 384)

Glacial routefinding tips

- Shift between big picture and close-up while navigating (P. 386)
- Find and link crevasse-free zones : inside of turns, zones of compression (P. 377)
- Use time of day / year to your advantage
- Memorize major terrain features
- Mark / record your route with wands, topo map or GPS

Spacing, 60 meter rope (p. 382)

- 3 climbers w/ 10m spacing = 20m climbing / 40m carry (20 x 2)
- 4 climbers w/ 8m spacing = 24m climbing / 36m carry (18 x 2)
- 2 climbers w/ 10m spacing = 10m climbing / 50m carry (25 x2)

GLACIER TRAVEL GEAR (p. 380)

Ropes: 50 - 60 meter 8-9mm dry rope (p. 378)

Ice axe(s)

Snow picket, 2 ft and / or ice screw

Runners

- Two singles (2ft.)
- One double (4ft.)

- Cordellette, 7mm, 20ft.
 - Prusik, loop of 6mm cord (p. 379-380)
- Carabiners
- Four lockers (2 pear, 2 small)
 - Three non-lockers (wiregates)

Also consider wands, skis or snowshoes, and a pulley

PRACTICE STEEP SIG CLIMBING

TECHNIQUE IN CRAMPONS (p. 420-430)

Ascent

- Diagonal ascent - flat footing, and with cross over (p. 417-421)
- Pied troiseme (p.425)
- Front pointing (p.416)

Using the ice axe in steep snow

- Don't move to a more difficult technique unless compelled to do so by the angle of the slope!
- Piolet canne – best choice (p. 417)
- Piolet panne – “support” over adze (p. 422-423)
- Piolet manche – on “shaft” below head
- Piolet poignard – “high dagger” (p. 422-423)
- Piolet ancre – overhead, hand moves up (p. 423)
- Piolet traction – hanging and front points (p. 423)

Descent

- Duckwalk, facing out (p. 429)
- Plunge-stepping
- Downclimbing – facing in (p. 430)
- Lowering or rappelling (p. 439)

THE CONTINUUM OF TACTICS IN SIG CLIMBING

Self-belay and self-arrest (p. 340-344)

Roped and unbelayed - roped team arrest (p. 344, 389)

- Glacier Travel and Crevasse Rescue (p. 375-404)

Running belay (p. 345-346)

Fixed belay (p. 349-350)

DEMONSTRATE AND PRACTICE BELAYING IN SIG CLIMBING (p. 349-350, 436-439)

Unanchored belays

- Terrain belay - moat, ridge crest, snow seat
- Snow seat or hip belay (p. 351)
- Standing boot-ax belay (p. 351, 438)

Anchored belays (p. 346-351)

- Anchors match probability and severity
- Direct vs. harness belay (p. 349-350, 437)
- "You" as part of the anchor (p. 349)
- Belay device vs. munter hitch (p. 350, 437)

DEMONSTRATE, PLACE AND ASSESS SNOW PROTECTION

- Picket in T-trench deadman configuration (p. 347)
- Picket or ice ax in stake configuration (p. 347)
- Deadman (p. 347-348)
- Snow bollard (p. 349)
- Snow fluke (p.348)

DEMONSTRATE, PLACE AND ASSESS ICE PROTECTION

- Ice screw (p. 432-433)
- V-Thread (p. 434-435)
- Ice Bollard (p. 435)

DEMONSTRATE AND PRACTICE LEAD CLIMBING ON SNOW

Teams of three or four tie-in and take turns leading uphill while placing snow and ice protection in a running belay or a pitched climbing configuration. Practice transitioning between each if conditions allow. Each person should have a chance to be a leader, a middle and an end person. The turn for each leader ends with establishing a two-point anchor protected by position, and belaying the team to safety.

SIG 2.2

ORIENTATION AND SAFETY

- Packing appropriate gear and clothing
- Orientation to area, topography, considerations
- In case of emergency
- Approach and descent considerations

PRACTICE STEEPER SNOW / EASY ICE CLIMBING TECHNIQUES

On steep snow, moderate ice, or a mix of both, explicitly practice the following techniques:

Footwork in crampons

- Pied troiseme – 3 o' clock
- Front pointing

Axes / Tools

- Piolet panne – "support" over adze
- Piolet poignard – "high dagger"
- Piolet manche – on "shaft" below head
- Piolet ancre – "anchor" then move hand up shaft
- Piolet traction – full swing and arm hang

Piolet Traction Technique Refinement

- Parallel tool progression: swing, swing, kick, kick
- Alternating tool progression: swing, kick, kick, center under tool.
- Use the "monkey hang" technique (p. 444)

- Minimize number of and force used in swings and kicks

LEAD CLIMBING ON SNOW / EASY ALPINE ICE

Teams of two, three or four climb an actual multi-pitch snow or easy alpine ice route. Team members take turns leading and placing snow and ice protection in a running belay or a pitched climbing configuration. Practice transitioning between each tactic if conditions allow. Each person should have a chance to be a leader, a middle and an end person.

AS AVAILABLE: DEMONSTRATE AND PRACTICE TEAM ARREST

Teams of three simulate the forces of a crevasse fall and practice team self arrest, taking turns in each position. The exact moment of "the fall" should not be announced.

AS AVAILABLE: PRACTICE PRUSIKING OUT OF A CREVASSE

Individuals practice self-rescue from a hanging position in a practice "crevasse" by removing pack, attaching foot and waist prusiks and ascending to safety.

AS AVAILABLE: DEMONSTRATE AND PRACTICE CREVASSE RESCUE STEPS (p. 388-404)

1. Stop the fall and stay in self-arrest (p. 389)
2. Build the anchor using at least two equalized pieces of protection. (p. 389-390)
3. Transfer the load from the rope to the anchor using a friction hitch and releasable knots. (p. 390-392)
4. Check on the climber to assess the situation (p. 391)
5. Devise a rescue plan (p. 392-393)

Rescue options:

- Prusik out by climbing the rope (p. 393-395)
- Transfer to a lower - climber descends to safety
- Transfer to a belay - climber climbs out to safety
- Transfer to a haul – team must lift climber out using mechanical advantage and human power (p. 396-404)