

SMC SNOW, ICE AND GLACIER CLIMBING LEVEL 1 TRAINING COURSE SYLLABUS

SIG 1.1

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

1. PRESENTATION

Pass out rope for knot tying, stickers, syllabus, and any other materials. Use laptop and digital projector showing SIG 1 presentation.

ORIENTATION

Meet and Greet Activity

Welcome to SMC

- Mission: Connect, Learn, Climb
- Membership advantages and benefits

Overview of all SIG Courses

SIG 1 Learning Objectives

- Build a foundation
- Impart core knowledge
- Learn critical technical skills
- Cultivate expedition behavior (p. 470)

SAFETY AND OVERVIEW

The Rewards of Mountaineering (p.14)

Inherent Risks of Mountaineering

- Objective Hazards (p. 378, 488-489)
- Subjective Hazards (p. 488-89)
- Risk Management as a member of a team (p. 489-494)

Managing Risk (p. 485-494)

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

Scope of Modern Ice Climbing

- Synopsis of mountaineering history
- Alpine Ice
- Waterfall Ice
- "Mixed" Climbing
- Extreme mountaineering or "Alpinism"

Training for Ice Climbing (p. 15, 73-82)

SMC opportunities for Ice Climbing

INDIVIDUAL AND TEAM SAFETY

Self-arrest (p. 340-344)

- Purposes and scope

- Ideal set up
- Variations
- With crampons
- Execution and recovery

Roped and unbelayed (p. 344)

Running belay (p. 345-346)

Fixed belay (p. 349-350)

Roped team arrest (p. 389)

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

ICE CLIMBING WORLD TOUR

Local Crags

California Climbing

California Alpine Ice Climbing

Elsewhere in the Continental US

Further Abroad

ESSENTIAL KNOTS

Snow, Ice and Glacier Climbing Knots:

- Fig 8 Follow Through (p. 141-142)
- Clove Hitch (p. 143)
- Klemheist Hitch (p. 146)
- Prusik Hitch (p. 145)
- Munter Hitch (p. 147)
- Alpine Butterfly Knot (p. 143)

SNOW, ICE AND GLACIER CLIMBING ARENA

Rating Systems (p. 567-570)

Features of Snow, Ice & Glaciers (p. 376,377,352-353)

THE CYCLE OF SNOW

Surface forms (p. 542-546)

Metamorphosis of snow and ice (p. 546-547)

Definition, formation and characteristics of a glacier (p. 547-548)

Understanding Avalanches (p. 356-374)

SIG CLIMBING PERSONAL GEAR

Crampons Types and Uses

- History, types (p. 325-326, 441)

- Hinged, Semi-Rigid, and Rigid (p. 325, 407-408)
- Attachment and Fit (p.326)
- Important Features (p. 326-328)
- Maintenance (p. 327)

Ice Ax and Ice Tools Types and Uses

- History, Types (p. 323, 408-409, 442)
- Parts (p. 321-322, 408-412)
- Lengths (p. 322-323)
- Features and Uses (p. 331-332, 408-412)
- Selection (p. 409)
- Maintenance and Safety (p. 323)

Mountaineering Boots Types and Uses (p. 26-28)

- Lightweight 3-Season Mountaineering Boots
- Full "Winter" Mountaineering Boot
- Plastic Boots
- Ski Mountaineering Boots

Harnesses Types and Uses (p. 148-150)

- Ice Climbing Harnesses
- Mountaineering Harnesses

Snow Protection

- Ice Axe (p. 349-351)
- Picket (p. 346)
- Snow Fluke (p. 348)
- "Deadman" (p. 347)
- Snow Bollard (p. 349)

Ice Protection

- Ice Screw (p. 412)
- V-Thread (p. 434)

Clothing and Layering for SIG climbing (p. 406)

SIG Climbing Ropes (p. 413)

Cordage / Webbing / Runners (p. 150-152)

Carabiners Overview (p. 153)

Helmets (p. 147-148)

Snowshoes (p. 329)

Trekking Poles (p. 328)

Ice Climbing and Skiing Packs, Skis, Skins,

Bindings (p. 329-330)

Shovel (p. 330)

Wands (p. 328)

2. PREP FOR OUTDOOR INSTRUCTION

Each student is outfitted and inspected for proper boots, crampons and fit, ice axe and helmet. Once this is completed, gather outside.

3. OUTDOOR INSTRUCTION

On snow slopes up to 40 degrees right outside the classroom. Instructors demonstrate technique and coach students as they practice uphill then downhill techniques in progression.

SNOW CLIMBING TECHNIQUE IN BOOTS

Routefinding on snow (p. 351-356)

Each technique is replaced by the next as the slope steepens

Ascent

1. Rest step (p. 113-114)
2. Pied en canard aka "duck walk" (p. 416-418)

3. Rising traverse with transitions - boots and ice ax positions (p. 336)
4. Step-kicking - direct and diagonal (p. 334-335)

Descent

1. Descending traverse, with transitions
2. Plunge-stepping - straight and diagonal (p. 337)
3. Downclimbing, facing in (p. 338)

Using the ice ax for travel and soft snow

1. Piolet canne – pick forward, or self-arrest (p.332) right or left hand
2. "Stake" position with both hands, center position (p. 334)
3. Stowing the ice ax (p. 331-332)

CLIMBING TECHNIQUE IN CRAMPONS

Ascent

1. French technique, or "flat footing"
2. Cross over facing left and right (p. 417-421)

3. Pied troiseme or "3 o' clock" and 9 o' clock (p.425)
4. Front pointing (p.416)

Using the ice axe

1. Piolet canne – walking and approach (p. 417)
2. Piolet panne – "support" over adze aka low dagger (p. 422-423)

Descent

1. Flat-footing, facing out (p. 429)
2. Downclimbing – facing in (p. 430)
3. Lowering or rappelling (p. 439)

4. PRACTICE

In equal teams, take turns breaking trail to a larger and/or steeper hill where individuals can then take turns leading their groups in practicing all ascent and descent techniques in succession.

SIG 1.2

ORIENTATION AND SAFETY

Orientation to area, topography, considerations
In case of emergency

SELF ARREST DEMONSTRATIONS AND PRACTICE

We'll establish a track with a safe runout in which to practice all four self-arrest positions multiple times, focusing on effectiveness and precision, with and without crampons. Use helmets and caution against wounds from adzes. Instructors should be spotting each student.

SELF BELAY DEMO AND PRACTICE

- Set-up and importance
- Making turns and transition
- Practice moving self-belay

SELF ARREST SEQUENCE

1. Maintain firm self arrest grip at all times
2. Use proper ice axe "ready" position
3. Spin or maneuver so you can return to head uphill on your belly

4. Always roll toward the head of the axe
5. Execute the pick plant ASAP with force and purpose
6. Effective techniques while stopping (face turned away, spike high against ribs, pick away from face, feet or knees digging in)
7. Stop - proper recovery position, including final kick

SELF ARREST PRACTICE

Instructor explains and demonstrates each position in sequence, followed by student practice

POSITION #1 Head uphill on belly
POSITION #2 Head uphill on back
POSITION #3 Head downhill on belly
POSITION #4 Head downhill on back

Practice all four positions multiple times with the axe in both hands, with and without crampons. Option to attempt them with a pack on for perspective.

DESCENT ON SNOW, DEMO AND PRACTICE

- Sitting glissade, including stopping with self arrest practice
- Plunge-stepping, straight and diagonal
- Flat-footing, facing out
- Descending steep snow by downclimbing facing in

STEEPER SNOW INTRODUCTION

- Pied en canard with cross over
- Pied troiseme – 3 o' clock
- Piolet panne – "support" over adze
- Piolet poignard – "high dagger"
- Piolet manche – on "shaft" below head

SNOW CLIMBING TECHNIQUE REVIEW

Ascent without crampons review and practice

- Step-kicking, direct
- Step-kicking, diagonal

Ice ax on snow demo and practice

- Piolet canne, both grips, left and right
- "Stake" position with both hands in center on head