

Colorado Outdoor Recreational Leadership Course Scope and Sequence

Course Name	Ice Climbing		Course Details	Level 3 course in the Outdoor Recreational Leadership Pathway.	
			Course = 0.50 Carnegie Unit Credit		
Course Description	This course introduces technical (roped) ice climbing, including equipment selection and safety, knots, belaying and climbing, rappelling and climbing safety.				
Note:	This is a suggested scope and sequence for the course content. The content will work with any textbook or instructional resource. If locally adapted, make sure all essential knowledge and skills are covered.				
SCED Identification #		Schedule calculation based on 60% of a semester instructional time. Scope and sequence allows for additional time for guest speakers, student presentations, field trips, remediation, or other content topics.			
All courses taught in an approved CTE program must include Essential Skills embedded into the course content. The Essential Skills Framework for this course can be found at https://www.cde.state.co.us/standardsandinstruction/essentialskills					
Unit Number, Title and Brief Description	CTE or Academic Standard Alignment	Competency / Performance Indicator	Outcome / Measurement	CTSO Integration	
Unit 1: Climbing Signals and Safety		Understand ice climbing and all its facets as part of the art of mountaineering.			
Unit 2: Knots and Rope Management		Develop skills in descending (rappelling), placing ice screws as a means of protection, belay techniques, knots, and rope management.			
Unit 3: Evaluation of equipment					
Unit 4: Belay Techniques		Develop skills in descending (rappelling), placing ice screws as a means of protection, belay techniques, knots, and rope management.			
Unit 5: Low Angle - French Technique		Demonstrate efficient movement and balance on low- to moderate-angle ice terrain using the French (flat-foot) crampon technique.	Maintain full crampon point contact while ascending, traversing, and descending low-angle ice terrain. Demonstrate proper foot positioning, including duck		

			walking, sidestepping, and crossover stepping techniques. Apply appropriate ice axe positions (cane and cross-body) while traveling on low-angle terrain. Evaluate terrain angle and select the French technique when it provides the safest and most efficient movement. Maintain balance and conserve energy through proper body positioning and weight distribution.	
Unit 6: Mixed Movement - American Technique		Apply mixed climbing movement techniques to transition efficiently between front-pointing and flat-foot climbing positions.	Demonstrate the American (hybrid) crampon technique on moderate-angle ice terrain. Transition smoothly between French and German techniques based on terrain features. Utilize the "three o'clock" or hybrid foot position to reduce calf fatigue. Maintain three points of contact during movement transitions. Analyze body positioning and center of gravity to maximize stability and efficiency during mixed movement climbing.	
Unit 7: Front Point - German Technique		Execute front-point climbing techniques safely and	Demonstrate proper front-pointing technique	

		efficiently on steep ice terrain.	using primary and secondary crampon points. Maintain appropriate heel position to maximize crampon penetration and reduce calf fatigue. Execute low dagger, high dagger, anchor, and traction ice tool positions. Place ice tools accurately using efficient swing mechanics and proper body alignment. Recognize and avoid common front-pointing errors, including over-kicking and excessive calf loading. Apply energy conservation strategies while climbing steep ice.	
Unit 8: Top Rope Technique		Demonstrate safe top-rope climbing systems and movement techniques in an ice climbing environment.	Properly inspect and utilize personal protective equipment for top-rope ice climbing. Demonstrate effective communication between climber and belayer using standard climbing commands. Apply efficient climbing movement principles while on top rope. Maintain appropriate body positioning and weight distribution during ascent.	

			Demonstrate safe clipping, lowering, and transitioning procedures while under top-rope protection. Evaluate risk factors associated with top-rope ice climbing environments, including falling ice and environmental hazards.	
Unit 9 : Flexibility & Balance		Develop the physical movement skills necessary to perform efficient and sustainable ice climbing techniques.	Demonstrate ankle, hip, and shoulder mobility required for French, American, and German climbing techniques. Maintain static and dynamic balance while climbing on varied ice angles. Apply body positioning strategies that maximize skeletal support and minimize muscular fatigue. Demonstrate efficient movement patterns that reduce energy expenditure during climbing. Evaluate personal strengths and limitations related to flexibility, balance, and climbing performance. Develop individualized conditioning and mobility strategies to improve climbing efficiency.	
Unit 10: Maintenance of ice gear		Inspect, maintain, and store ice climbing equipment according to industry safety standards and manufacturer recommendations.	Conduct pre- and post-use inspections of crampons, ice tools, harnesses, helmets, ropes, and hardware.	

			Demonstrate proper cleaning, drying, and storage procedures for technical ice climbing equipment. Identify wear patterns, damage, corrosion, and conditions requiring equipment retirement. Demonstrate proper sharpening and maintenance techniques for crampon points and ice tool picks. Explain how equipment maintenance affects performance, safety, and equipment lifespan. Maintain written equipment inspection and maintenance records consistent with professional outdoor industry practices.	
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Academic Standards Alignment

Colorado CTE courses are required to integrate academic and essential skills into course content. The following academic standards have been identified as aligned to this course and should be integrated throughout instruction.

[CO CTE Academic Standards Resources](#) (Rubrics, integration strategies, etc)

[CDE Colorado Academic Standards Online](#) (Online standards lookup tool)

Standard 1: Oral Expression and Listening

- Prepared Graduate 1: Collaborate effectively as group members or leaders who listen actively and respectfully; pose thoughtful questions, acknowledge the ideas of others; and contribute ideas to further the group's attainment of an objective.
 - Students collaborate during belaying, rope management, climbing communication, equipment inspections, and top-rope climbing activities, requiring active listening, clear communication, and teamwork to maintain safety and achieve climbing objectives.

Standard 2: Reading for All Purposes

- Prepared Graduate 4: Read a wide range of informational texts to build knowledge and to better understand the human experience.
 - Students interpret technical information related to ice climbing equipment, safety procedures, rope systems, climbing techniques, environmental hazards, and equipment maintenance standards to develop proficiency in technical mountaineering skills.
- Prepared Graduate 5: Understand how language functions in different contexts, command a variety of word-learning strategies to assist comprehension, and make effective choices for meaning or style when writing and speaking.
 - Students develop and apply specialized vocabulary related to mountaineering, rope management, crampon techniques, ice tool positions, belay systems, climbing movement, equipment inspection, and risk management.

Standard 3: Writing and Composition

- Prepared Graduate 7: Craft informational/explanatory texts using techniques specific to the genre.
 - Students maintain written equipment inspection and maintenance records and document equipment conditions and maintenance procedures using professional outdoor industry practices.

Standard 4: Research Inquiry and Design

- Prepared Graduate 10: Gather information from a variety of sources; analyze and evaluate its quality and relevance; and use it ethically to answer complex questions.
 - Students evaluate terrain characteristics, climbing techniques, equipment performance, environmental hazards, personal physical capabilities, and equipment maintenance practices to make informed decisions regarding safety and performance in technical ice climbing environments.

Note: *Mathematics and Science standards will be added in the future. Visit the [Colorado Academic Standards](#) page for the most current version.*