SKIING SKILLZ MODULE

Competition Introduction

Coaching Association of Canada / Association canadienne des entraîneurs

National Coaching Certification Program / Programme national de certification des entraîneurs

CONTENTS

PURPOSE AND OBJECTIVES OF THE COURSE

Developing and have excellent skiing skills and a basic knowledge of skiing mechanics are key elements in your development as skier and freestyle ski coach. The following information package is designed to supplement the information delivered in the TSM1 on snow course, and to enhance your knowledge about skiing.

With great skiing skills and a basic knowledge of the sport, you will be better able to:

- Support your athletes in training and competition.
- Analyze performance.
- Plan and progress training and skill development blocks (4-6 weeks of on snow training sessions).

Setting the Training and Learning Environment

Warm-up

The warm-up is a key and essential part of preparing for athletic performances. A good effective warm-up can ensure the athlete is prepared to perform at their very best either to achieve the desired training effect or competitive performance. The key is to make warm-ups fun, and skill specific while covering the basic warm-up principles.

Potential Benefits of Warming Up

Increased circulation resulting in:

- Increased blood flow to the muscles.
- Increase oxygen delivery and uptake to the muscles.
- Decreased vascular resistance.
- Increased metabolic rate.
- Increased cardiovascular to sudden strenuous exercise.

Increased body and muscle temperature:

- Increased speed of nerve transmission.
- Reduced muscle viscosity = smoother muscle contractions and increased mechanical efficiency
- Increased resistance to strain; a warm muscle can handle greater tension at the muscula-tendon junction.
- Increased sensitivity of nerve receptor = you have great awareness where your body is
- in space.

Basic Rules

1. Warm-up should reflect the activities you are focusing on and your Freestyle skiing: Therefore, fun games and exercises that incorporate the skills out lined in this manual are a GREAT way to make warm-up skill based and specific.

2. Increase body temperature and circulation first (this is often called GENERAL WARM-UP): This requires 10 minutes of continuous activity your athletes should be WARM after this phase of the warm-up.

3. Following this with dynamic range of motion (ROM) work which can also include exercises which activate the muscles for movements that are elements important to freestyle skiing: Lower body and hip flexor ROM is really important here.

4. Integrate a few exercises that address functional weaknesses and prevent sport specific injuries. This reminds these muscles to work and ensures you are working on improving these areas. Single leg stability exercises that focus on the knee tracking over and slightly behind the second toe are really important, standing hamstring activations/curls and working on neutral pelvis (described on page XXX)

5. After the ROM and stability work perform movements and exercises that reflect the quality and intensity (SPECIFIC WARM-UP) of what your training session will entail. Add a few exercises that address your technical or physiological weaknesses (For example: if your training session is going to be focused around quickness work on quickness and agility do some foot work and gliding agility games in warm-up.

6. Pay attention to how the athletes are moving and be diligent with technique; it prepares their focus mentally and physically. Look for energy levels and adjust your training program accordingly.

7. Develop (and practice!!!) warm-up routines that are effective for the athletes' performance mentally and physically (especially for pre-competition).

8. Complete the warm-up with some mental imagery or rehearsal to further remind the mind and body that they are totally prepared for a great training session or workout.

9. The effects of the warm-up will ...

Warm-up Tips

- Make sure static and dynamic balance work is part of your warm-up.
- To help prevent knee injuries, work in some backward running and jumping into the warm-up to activate the hamstrings. Landing drills and single leg stability are key for knee warm-up as well.
- Make sure there are games in the warm-up session.
- Have some regular exercises that athletes can continue to practice and work on that are specific to skiing skills.
- Make your warm-ups energetic, focused, fun and give technical and body position feedback.

SKIING FREESTYLE CANADA: BASIC SKIING SKILLS

Skills:

1. Stance and Balance
2. Steering and Edging
3. Absorption and Pressure Control
4. Timing and Coordination

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1. Stance and Balance: Maintain Balance in Motion (Dynamic Equilibrium)

Correct body position will enable the athlete to maintain balance and allow proper range of motion throughout all skiing movements. It should be natural and athletic with flexion in the three lower body joints; ankle, knee and hip. Weight is spread throughout the foot centered towards the ball to arch. The shoulders and hips should be on top of the feet with the knees over the toes. As a result of ankle flexion, the athlete will feel shin pressure throughout the turns. The upper body should be aligned over the feet. Arms are held comfortably in front with the hands at approximately mid torso height. The head is in a natural position with the vision looking ahead to read the upcoming terrain. The body position can vary
according to specific skiing situations.

- Stance is the way a skier aligns the body over the skis.
- Balance can be adjusted if the skier's stance is mobile.
- Balance is the skier's ability to use structure and musculature to keep from falling down.

Skiing Balance is broken down into 4 Planes of Movement

These movements help the skier to maintain balance in motion.

See the Freestyle Ski Wiki Link for demonstration of the below skills: www.freestylecanada.ski....

Photo

1) Lateral

The ability to adjust width of stance and body movement to balance in a side to side manner.

2) Fore aft
The ability to maintain alignment with the feet and the center of mass in a forward and backward motion.

Photos

3) Rotational
The control and adjustment of rotational movements between and within the upper and lower body segments. (Starting a turn with the upper body, e.g. Hips or shoulders are an example of being out of balance in the rotational plane.

4) Vertical
The ability to bend and extend the joints to control pressure and snow contact.

2. Steering and Edging

- Steering is the use of the legs and feet to help guide the skis in a specific direction.
- Edging is the ability to balance against the edge of the ski in a way that will utilize the side cut of the ski.
- Edging prepares the skier to control direction and speed.
- In order for the skier to develop an angle beneath the surface of the snow and the base of ski bending of the ankles, knees and hips is required. This allows the skier to roll the ski on edge WITHOUT tipping to the inside of the turn. Tipping to the inside of the turn will result in the ski losing adherence to the snow and the ski will slide or skid. Therefore angulation (bending of the ankles, knees and hips) is required prior to rolling the ski on edge for the skier to set and maintain direction in a turn or to control speed.
- Carving is well timed steering and edging.

3. Pressure Control/Absorption

- The ability to load and unload the skis at the appropriate time by balancing against turning forces and/or using muscular efforts.
- Appropriate steering and edging release can lead to pressure build-up on the skis, or release.
- Effective pressure control helps speed control.

4. Timing and Coordination

- Timing is the skier's ability to choose and use an action at the appropriate moment.
- It is a key skill as it ties the skills to the phases of the turn and jumping. Therefore, effective timing will allow skiers to perform to their skill potential. However, execution error of the above-mentioned skills can prevent the skier from having good timing as they are not in a good position to execute a well carved turn.
- The effectiveness of timing is related to the loading and unloading of the ski (pressure control). This is achieved by performing specific movements (refer to turn phases for specific movements) at a specific time.
- Coordination is the ability to sequence multiple movements, with appropriate timing

5. Carving Turn

There are two basic requirements in order to make ski(s) carve:

1) The ski will bend when edged
2) The ski will not skid only when all the points of the edge pass through the same point on the snow surface

Radius of a turn is determined in combination with edge angle, calculation of side-cut, determine, edge angle (Stance and balance; edging and steering), and bending of the ski (pressure control). Carving typically involves the skier making a series of "C"s or half circles down the hill. The turns are accomplished by utilizing a "rolling" of both skis from edge to edge.

Photo

SKIING FREESTYLE CANADA: Phases of the Ski Turn

Each phase is equally important. As turn radius gets shorter care must be taken to not eliminate or blend one or more phases.

1. Transition

Transition links turns and sets the skier into their neutral position. The transition box describes the space on the snow between edge release from the previous turn to edge engagement for the new turn. Transition is the only point of a turn where the objective is running a flat ski while in motion. Direction of transition is the same as the end of the previous turn. As the skier enters the transition box the skier up unweights and the ski edges are released using the ankles and knees to roll the ski onto a flat base. The weight is balanced equally on both feet, the body is stacked (shoulders, hips and knees on top of the feet) and perpendicular to the slope and the feet, knees and hips face the direction of travel. At this point the athlete should project their body centre of mass in the direction of travel (diagonally downhill aiming to the middle of turn). The skier then shifts majority of weight to the outside ski, presses down onto the balls of feet and into the fronts of their boots. The skis should not change direction (pivot) during transition.

2. Initiation

Initiation happens immediately after exiting the transition box. The ankle, knee and hip joints are used to roll the skis onto edge. This is so that the ski characteristics can be maximized using the complete turn for control without skidding. The hip and body remain stacked over the feet. The hips and feet are facing the same direction as in transition.

To effectively carve the ski (the application of effective edging and pressure control) the hips MUST remain over the ski and feet during this phase. Initiation is a gradual process of putting the ski onto its edge to "initiate" the technical aspects of the ski: side-cut and reverse camber. Some pivot is necessary but should be minimized.

3. Shaping

The knees lead the way with the hips and feet following. During this phase of the turn the body's centre must continue to move towards the middle of the turn not the end of turn (downhill). During the shaping phase, it is up to the skier to determine the angle of edge necessary along with the amount of pressure needed to create the desired radius of turn.

Separation and counter rotation of the upper and lower body develop through shaping phase to maintain pressure of the edge.

4. Completion

Once the skis pass through fall line the hip and upper body remains level and square to the fall line in short radius turns Counter rotation in this phase helps maintain pressure on the outside ski. The skis should stay on edge until the turn is completed and the skier enters the next transition.

TSM1 Drills

Drills are designed to target specific skiing skills in need of improvement. Drills must be done with intent to be effective. Keep the key points below in mind whenever you are choosing or evaluating a drill.

- What is the intention of the drill
- How the drill is to be executed
- Why this drill has been chosen
- Terrain and snow conditions
- Turn
- What are you looking for?

Stance & Balance Drills

1. Extremes/Airplane Turns

Terrain: Medium radius turns on flat to moderate groom terrain.
Objective: Feeling the extremes will help feel the correct position. Also helps relate correct body position to correct ski use.
Description: Intentionally moving to the extremes of the lateral and fore/aft planes of balance. Leaning forward, backward, inside and outside as far as possible while maintaining turning rhythm.
Watch For: Make sure movement is significant through all planes.

2. Loose Boots

Terrain: Can be done in a variety of terrain but safety is the primary concern. Know the athletes' abilities before challenging them with varied or difficult terrain. Speed should always be kept slow.
Objective: Without the rigidity of the boots the skier will have better feeling of balanced and unbalanced. Will help identify where weight is felt on the sole of the foot. Increases ankle joint mobility.
Description: With boots very loose (buckles & power straps) perform varied turns.
Watch For: Correct body position to achieve balanced position. Strive for correct ski use (edging).

3. Hop Turn

Terrain: Can be done on any pitch groom terrain with any turn radius. Shorter turn radius and/or increased turn rhythm increases difficulty.
Objective: With unbalanced or incorrect body position the skier will not correctly perform (time?) the hop or not be capable of hopping.
Description: Performing one or more hops at predetermined point(s) of the turn. Common points are: middle of turn, through transition or constantly throughout the turn (1000 hops).
Progressions: The placement of the hop within the turn radius can be moved to focus on balance through specific phases.
Watch For: A balanced position and fluid motion. In middle of turn hop the skier should hop and land on edge with no deviation in ski direction while airborne. The hop must be timed to leave the snow when the skis are at fall line. The hop should not interrupt the continuity of the turning rhythm.

4. Inside Ski Tap

Terrain: Any groom terrain.
Objective: Correct weight position on outside ski throughout the turn
Description: Similar to hop turns but and easier variation. Rather than hop at various points of the turns have the athletes continuously tap the inside ski throughout the turn radius.
Watch For: Balanced position will allow the athlete to maintain a consistent tapping rhythm. The inside ski should remain parallel to the snow. If only the tip or tail comes off the snow then fore/aft balance is incorrect.

5. Poles on hips

Terrain: Flat to Medium groom.
Objective: Maintain correct hip position over feet and square.
Description: Holding the poles horizontal against the front of hips with wrists while making medium to short radius turns.
Watch For: The athlete should always feel consistent pressure of the poles onto both hips.

Steering & Edging Drills

1. Corridor

Terrain: Groom terrain, moderate to steep pitch.
Objective: Used primarily for edging but is also useful to correct body position.
Description: The athlete slides down the slope rotating their feet 180 degrees while keeping the upper body square to the fall. The objective is to remain in a narrow corridor with the feet working directly underneath the body.
Watch For: Ensure the upper body including hips stay square to the fall line. The feet must remain directly under the body and not push out to the side. The upper body needs to be perpendicular to the slope. The skis should deflect far enough across fall line to feel tension in the core.

2. 360's

Terrain: Groom terrain any pitch.
Objective: Used to feel control of edges.
Description: The skier performs constant 360 degree rotations to feel use of the edges.
Watch For: Ensure the athlete is centered on the skis and not moving excessively forward and aft to assist in making the rotation.

3. Cross Fall Line Edging

Terrain: Flat Groom
Objective: Cross fall line edging is the movement needed for correct turn initiation.
Description: The skier begins stationary facing across the fall line in wide stance with correct neutral. Shoulders, hips, knees and feet are all facing the same direction. Weight should be fairly equal with a slight bias to the downhill ski. The skier slowly traverses across the fall line edging both skis into the slope using the ankle and knee joints only.
Progression:

1) Once the skier is proficient at cross fall line edging they can gradually increase radius of turn by starting the drill facing more down the fall line. If cross fall line is 3/9 on a clock face the skier should move to 4/8, then to 5/7.
2) Fall line to end of turn with square body.
3) Downhill – Uphill Edging. This is the same movement as cross fall line but edging both ways, into the slope and down the slope.

Watch For: The hips and shoulders must always face the same direction with no rotation or tipping. There must be no rotation of the feet or pushing of the ski tail downhill. The skis must remain parallel at all times.

4. Spaghetti Legs

Terrain: Groom slope flat pitch. Traverse roads are generally ideal.
Objective: Facilitates the feeling of mobility in the ankles, knees and hip joints.
Description: Facing down the fall line the athlete alternates rolling both skis from inside edges to outside edges making a series of hourglass shaped tracks.
Watch For: Ensure the athlete is moving the lower body joints through a large enough range of motion. Maintain correct upper body position.

5. Rollerblade Turns

Terrain: Flat groom. Traverse roads are generally ideal.
Objective: Using the ankles and knees to edge the skis. The side cut of the skis dictate the radius of the turns.
Description: Skiing directly down the fall line using the ankles and knees to edge both skis making a series of quick shallow turns.
Watch For: Ensure there is no steering of the skis, push of the heels or rotation of the upper body, hips or feet. The skis should leave a very clean line in the snow.
Progression: Increased tempo of the turns.

Pressure Control Drills

1. High Mark

Terrain: Can be done on any pitch groom terrain. Ensure the surroundings are safe the area is not high traffic.
Objective: The skier who uses correct edging and pressure control should travel the farthest.
Description: A game played with a group of athletes. The coach will mark the starting point and the spot they must turn around. From the start, the skier will straight run and turn around the marked spot trying to travel as far back uphill as possible.

2. Hockey Stops

Terrain: Groom terrain moderate to steep pitch.
Objective: To stop in the shortest distance.
Description: The coach will mark the starting point and the spot they must stop at. From the start, the skier will straight run to the marked spot where they will stop quickly in as short of distance as possible. Watch For: The upper body must remain upright (not leaning up hill) and the feet must rotate directly under the body (not pushed in front).

3. Mogul Traverse

Terrain: Best suited to moderate pitch natural moguls.
Objective: Introduction to range of motion in the lower body joints to manage pressure in the skis and maintain ski to snow contact.
Description: Traversing through a mogul field to feel the pressure changes in the skis and how range of motion is used to control the pressure.
Watch For: The athlete must maintain correct body position through all range of motion. Shin pressure must be maintained and extension must be limited to the point of base neutral.

4. Big Turn in Varied Terrain

Terrain: Best done in flat to moderate pitch natural moguls.
Objective: As with mogul traverse this drill works pressure control through range of motion. It adds the elements of correct turn timing and turn shape within terrain.
Description: Similar to mogul traverse but with more speed and linking turns. The athlete must maintain correct body position through all range of motion. Shin pressure must be maintained and extension must be limited to the point of base neutral.
Watch For: Correct body position through the turns.

Timing & Coordination Drills

X-Jump

Terrain: Any Terrain, Any Pitch.
Objective: Correct alignment (stacked body position) and core tension from counter rotation.
Description: While continuously jumping off the snow the athlete rotates their skis up to 180 degrees landing on edge. the upper body (including hip as much as possible) stays square down fall line and the rotation should only come from the lower body.
Progressions: steeper terrain, uneven terrain and/or faster hops.
Watch for: The tempo must be kept high with time spent in between hops minimal. The athlete should travel in a straight line directly down the fall line. The distance traveled down the hill should be kept as short as possible with the intent of jumping up, not out. The lower body must rotate directly underneath the upper (not pushing the feet outside or pushing the heels out). The upper body should remain calm and the skier should perform their pole plant as usual. If the athlete cannot maintain a fast pace they are out of position (incorrect alignment, inside or back) or not square.

Various Arm Position Drills (all done without poles):

1. Inside arm down the Hill

Terrain: Any (increase pitch, turn radius and/or variable terrain to increase difficulty).
Objective: To aid in feeling square body position middle to end of turn and correct body direction during transition to middle of turn.
Description: The skier will start with the inside arm facing direction of travel (across the hill) in transition with the outside arm on the hip. As the skier initiates a turn the inside arm remains facing the ski direction until the skis reach fall line. At fall line through completion of turn the inside arm will point straight down the fall line.
Watch For: Speed of movement and timing of arm change. Movements should be fast and accurate with arm change takes place through transition box. Square position comes from low in the core, not only shoulder direction. Separation and counter rotation should occur from middle to end of turn.

2. Inside Arm Up

Terrain: Any (increase pitch, turn radius and/or variable terrain to increase difficulty)
Objective: To aid in feeling separation middle to end of turn.
Description: Similar in timing and movement to Inside Arm but instead of down the hill the inside arm reaches up. The lift felt on the inside half of the body should come from the hip not only the shoulder to ensure correct separation movement.
Watch For: Speed of movement and timing of arm change. Movements should be fast and accurate with arm change takes place through transition box.

3. Front Squat Arms

Terrain: Any (increase pitch, turn radius and/or variable terrain to increase difficulty).
Objective: Arms are held as in front squat (hands on opposite shoulders with elbows held high.
Description: To aid in feeling correct counter rotation movements low down in the core (coil).
Watch For: Elbows remain high and square down the fall line middle to end of turn.

Projection Drill

Skating
Terrain: Flat Groom
Objective: Feeling of movement necessary of projection
Description: the skier will push off one ski and shift their entire body over to the other. Once stacked on top the skier will edge the ski and let the sidecut and pressure turn them to fall line. At fall line the skier then pushes off and repeats the movements.
Watch For: the upper body moving as a unit with the shift and projection coming from center. Shoulders stay level and do not imitate the movement. Head, shoulder and hip plane stay level.
Progressions: increase tempo, add pole plants.

Training Aids

1. Brushes

Brushes are a visual aid and an effective training tool in any terrain to clearly illustrate correct turn timing, desired turn shape or line.

2. Carving Skis

The combination of significant side cut and soft flex will make feeling the natural properties of the ski easier.

Definitions:

Pivot: Rotation of flat ski(s)

Steering: Rotation of ski(s) on edge

Angulation: Use of the lower body joints to create edge angle

Separation: The independent movement of upper and lower body throughout the turns. Separation occurs at the hip joint and allows the skier to remain balanced on the outside ski

Counter Rotation (Coil): Twisting action in the core muscles to maintain a square position.