

Basics of Fitness and Skating

This document provides a brief description of the basics of fitness and skating as they apply to PHED 1137. The primary intention of this document is to give you material that you should know for the written exam in the course. It begins with basic fitness rules as discussed on the first day of class¹, then goes into the basic mechanics of skating and the various skills that are required for the course.

The role of fitness in our society has changed over time as our jobs have typically migrated from physical labor to mental labor. This, and the technological changes that have driven it, have led to Americans typically being more sedentary in our normal lives. As a result, we must schedule times and activities that provide us the physical activity that we need in order to maintain proper health. There are numerous reasons that we want to keep ourselves physically fit. Activity basically helps your body to be more efficient. There are several specific benefits that go along with this.

- Stronger heart
- More effective circulatory system
- Decreased body fat
- Stronger bones
- Stronger, more efficient muscles

Of course, in order to achieve these benefits we have to have the proper amount and type of physical activity. In order to achieve aerobic fitness you should be exercising 3-5 times each week, with each exercise session providing 20-30 minutes of continuous exercise. Of course, for your exercise routines to be effective they must be of the proper intensity. You want to keep your heart rate in a target-zone that is 70-85% of your maximum heart rate. You can estimate your maximum heart rate as 220 minus your age. So for the average college student this means your maximum heart rate is about 200 bpm and you want to aim for a sustained heart rate of 140-170 bpm during your workouts.

If your goal for your workouts is not just to maintain proper aerobic fitness, but to lose weight, more activity is needed. In that case you will want to exercise five times each week and have your exercise sessions last about 45 minutes each. Your target heart rate remains the same as for standard fitness workouts. For weight loss you also need to be a bit more selective when you pick the type of exercise that you will be doing. In this case the exercise does not have to be continuous because what really matters is the total amount of work that you do. However, weight bearing activities are typically best for losing weight, so swimming would not be a good option, but roller skating would (assuming you can get out to a rink five times each week).

More than likely you aren't going to use skating as your only form of exercise, but it can be a useful activity in an overall fitness plan. The primary challenge in skating is to maintain balance and use proper form to get yourself moving. To help you maintain balance, you should use a stance with your knees bent and your back straight. Bending at the knees lowers your center of gravity and gives you extra control. Keeping your back straight helps to keep your center of gravity over your region of support. The region of support is basically the region containing both of your feet and the area between them. As long as your center of gravity is above this region, you are balanced. It is essential to remain balanced when skating because you don't have significant friction with the ground in the forward and backward directions. This is unlike the situation in normal walking.

When you walk, you are actually throwing yourself off balance to move forward, then placing a foot in front of you to catch your fall. This motion doesn't work well on skates, because as soon as your center of gravity is in front of the region of support, the downward pull of gravity will tend to cause your skates to move backward. You are used to being able to apply a force to the surface you are walking on to move part of you forward so that you can return to a balanced position. Without friction you can't apply this force and attempting to simply leads to your foot moving in the opposite direction of where you were trying to go. This is why it is so hard to walk on a slick surface like ice. Icy surfaces provide very little friction in any direction, so any attempt to push against the ground typically results in your foot sliding. Unless you compensate for this you fall.

Fortunately, skates aren't as bad as ice. On ice you don't have significant friction in any direction. On skates, the friction is only lacking forward and backward, but you do have friction and can apply a force to the ground in a direction perpendicular to the roll of the wheels. This ability to apply a force is the basic mechanism for moving on skates. Again, unlike when you are walking, you do not want to throw yourself off balance on

¹ The section on fitness is based on notes provided by Dr. Hockey.

skates. This is particularly true of having your center of gravity behind or in front of the region of support. However, by turning one of your feet out at an angle you can push off and give yourself forward motion. By transferring weight to the skate that is now moving, you can lift the other skate and bring it forward, then repeat the motion pushing off with the other foot. This is the basic motion of roller skating. The key is using the roll of the wheels and not throwing yourself off balance.

Another critical aspect to proper skating form is to keep your eyes up. Don't look at your feet. The skating floor is flat so you don't need to be looking down for small items that might trip you up. (Even small children are large enough for your peripheral vision to catch them.) As you might have learned in driver education, you tend to follow your eyes. On skates this means that looking down is a great way to end up on the floor. A big part of this is because looking down typically causes you to lean forward instead of keeping your back straight. This is likely to move your center of gravity in front of your region of support.

Skating backwards can be done in a similar way to skating forward. However, the standard form for beginning backward skating is a bit different. This is because moving backwards isn't as natural and that makes balance a bit more challenging. The standard way to start skating backwards does not involve picking up your feet. You begin with your feet close together standing with your toes pointed in. Using your hip muscles you push your feet apart, which will cause you to begin rolling backward. Obviously, continuing this motion until you are in the splits is not ideal. Instead, you put your weight on your toes and draw your heels in so that your toes are now pointed out. Then you pull your feet back together to continue your backward motion. Once your feet are close again, you slide your heels back out so your toes are pointed inward and repeat the entire motion. After you have practiced this and become comfortable with the general motion and the balance for going backwards, you can change your style to drive with one foot at a time. In general, when you are skating backwards you will put more of your weight on your toes and slide your heels around. This is in contrast to skating forward where the most natural stance will typically put more weight on your heels and you adjust your feet by sliding your toes.

One of the other "basic" motions of skating that you should be familiar with is the ability to cross over your feet on the turns. This is a rather simple motion that will make your turns more fluid and also allows you to maintain or even gain speed through your turns. To execute a crossover you shift your weight to your inside foot, lift the outside foot, cross the outside foot in front of the inside foot, and place it back on the floor. As you place the outside foot down in front you shift your weight to it. You then let the outside foot, which is now in front, basically roll straight forward while you lift the inner foot and place it back in front. You repeat this motion as you go through the turn. The key to the crossover is that your feet are always rolling straight forward because each time you place a foot down you turn it so that it is aimed further through the turn. This motion will tend to naturally cause you to increase your speed. When you have mastered it, you will be able to push off with both feet, giving a little extra push with each foot before you lift it up.

The last set of motions that you need to master are those for turning from going forward to going backward and vice versa. As with any maneuver you do on skates, there are many methods for turning from one direction to the other, but not all of them will achieve the desired result of having you maintain most of your momentum. The simplest way to turn around on skates is with two discrete steps. You begin by picking up one skate and turning it 180 degrees relative to the other one before setting it down. You then shift weight to the skate you have just turned and pick up the other skate and bring it around. This maneuver will have you briefly skating with your feet facing in opposite directions. This requires a bit of flexibility, but you really want your feet as close to 180 degrees as possible because if you don't get to 180 degrees you will tend to go into a spinning motion that will take away your momentum. Unless you are good at holding the position of having your feet pointing in opposite directions with your toes facing out, you will want to make the two steps in this motion quickly.

Some students have been tempted to make the turn from forward to backward by stepping one foot in front of them with toes pointed more inward. This might feel natural and might be how you turn when walking normally, but it doesn't work well on skates because it will put you in a position where one foot is sitting perpendicular to the other and it will generally be in the way of that other foot moving. Since you will have forward momentum when you are doing this and you typically want to keep it, placing one foot perpendicular in front of the other typically leads to tripping.