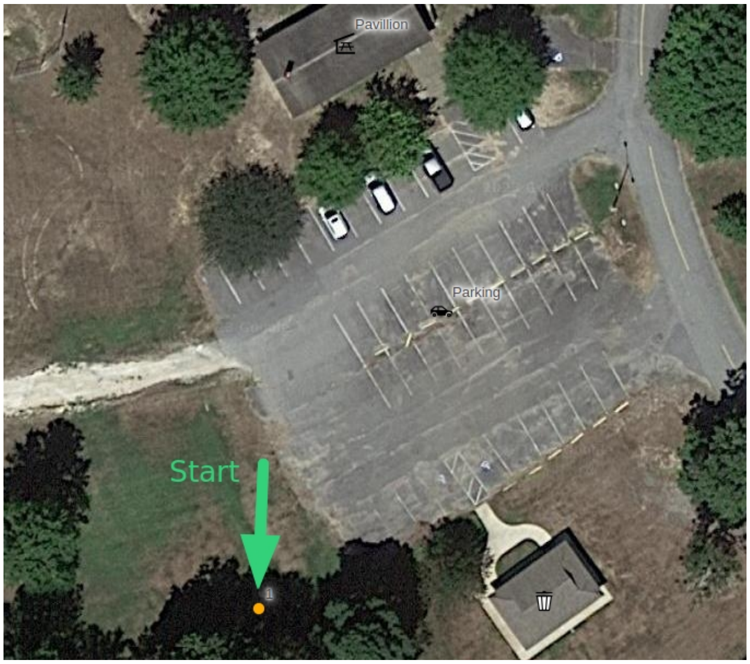
Mills Park- Land Navigation Compass Course

This rudimentary course is designed to get you acquainted with basic land navigation all within the conveniences of your local park. The course is laid out with 12 orange markers that delineate 11 separate "legs" to walk. The course starts with marker 1 at the beginning of leg 1. Leg 1 ends at marker 2, which is also the beginning of leg 2. Each subsequent leg begins at the last marker found. Altogether, the course is just under ¾ mile. Marker 1, your starting point, is located about 36' west of the southwest corner of the pavilion parking lot as shown here.



The fundamental idea for this course is; if you know where you're at currently, you can find any other point by turning towards it with your compass and walking a known distance. Ideally, if you point in the right direction and you walk the correct distance, you'll land directly on the next marker. The concept is simple, but it takes practice.

You'll need just a few things in order to navigate this course.

The first thing you need is a good map or set of azimuths and distances. A map and a set of azimuths and distances for this course are provided at the end of this document. Excellent and free maps for other areas are very easy to obtain online. Check out https://www.usgs.gov/products/maps/all-maps or www.caltopo.com for some maps you can download and print.

The second thing you need for land navigation will be a compass. Any compass that's intended for land navigation and has bearings in degrees (no less than 2° precision) will work. A good choice is the mirror compass shown here. These compasses can usually be found at most sporting goods stores or online ranging anywhere from $10 to $100.

The last thing you'll need to know is your pace; that is, how many steps you need to walk for a known distance.

Why Not Just Use GPS?

Did you know it's not uncommon for GPS to fail? The GPS system is not "guaranteed" 100% of the time (www.gps.gov). What happens when GPS fails or its accuracy is degraded? Suppose the GPS doesn't fail completely, but is reporting poor information? Suppose you're out in the woods and you find yourself between mountains or landscape that obscures part of the sky blocking GPS satellite reception? What happens if your GPS batteries die or if your GPS receiver fails altogether?

GPS is one of the many wonderful advancements of technology and is often very helpful. But, like all technology, it's not 100% reliable 100% of the time. There are many reasons to not solely depend on the amazing technology of GPS. If you have a good map and a compass, you have a tried and true system which doesn't fail. But using a map and compass for land navigation is a skill only as good as the user and must be practiced. Even if GPS never fails you, knowing these basic land navigation skills will make the results from GPS more meaningful and your use of GPS will be more efficient and fulfilling.

Pacing

Without a ruler or tape measure, you'll need another method to estimate distance. One way to estimate distance is to know how long each of your steps are so you will know how many steps to walk in order to cover a certain distance. That's called pace. Pace depends on the individual, terrain, footwear, and even weather. Knowing your pace will help you estimate distances in everyday life as well, so it's worth knowing your pace.

Start by marking a known straight-line distance. Distance for this course will be in units of feet, so lay out a known distance in feet. The longer the distance you use for this exercise, the better. Try to do this on level ground similar to what you'll be walking, using the same footwear you plan to use on the course.

For instance, the length the basketball court here at Mills Park is 104 feet. Or you can use the tennis court concrete foundation which is 130 feet. Start at one end of the court and walk a straight line to the other end. Use a normal casual pace you would normally walk so it's repeatable. Count the number of steps you take to get to the other end of the court. You can count each single-step (number of times either foot hits the ground), or every other, double-step (number every time your right or left foot hits the ground). Just be sure to count the same way on the navigation course. Now you can calculate your pace using steps / distance.

Suppose you use the tennis court (130 feet) and you count 57 single steps.

Your pace is **0.44 feet per single step** (57 steps / 130 feet).

You can calculate the number of steps you need for a specific distance by multiplying the distance by your pace.

For instance, if you are told to walk 245 feet, that's 107 single-step paces:

245 feet x 0.44 feet per step = 107 steps

Name:	Sample Pace Chart					Terrain:	Level ground, grass
	132	steps in	300	Feet			
Pace is	0.44	steps/foot					

Yards	Feet	Meters	Paces	Yards	Feet	Meters	Paces	Yards	Feet	Meters	Paces
1	3	1	1	105	315	96	139	220	660	201	290
2	6	2	3	110	330	101	145	240	720	220	317
3	9	3	4	115	345	105	152	260	780	238	343
4	12	4	5	120	360	110	158	280	840	256	370
5	15	5	7	125	375	114	165	300	900	274	396
6	18	5	8	130	390	119	172	320	960	293	422
7	21	6	9	135	405	123	178	340	1020	311	449
8	24	7	11	140	420	128	185	360	1080	329	475
9	27	8	12	145	435	133	191	380	1140	348	502
10	30	9	13	150	450	137	198	400	1200	366	528
20	60	18	26	155	465	142	205	420	1260	384	554
30	90	27	40	160	480	146	211	440	1320	402	581
40	120	37	53	165	495	151	218	460	1380	421	607
50	150	46	66	170	510	155	224	480	1440	439	634
55	165	50	73	175	525	160	231	500	1500	457	660
60	180	55	79	180	540	165	238	520	1560	476	686
65	195	59	86	185	555	169	244	540	1620	494	713
70	210	64	92	190	570	174	251	560	1680	512	739
75	225	69	99	195	585	178	257	580	1740	530	766
80	240	73	106	200	600	183	264	600	1800	549	792
85	255	78	112								
90	270	82	119								
95	285	87	125								
100	300	91	132								

When going uphill, you'll normally need more steps

When going downhill, you'll normally need fewer steps.

You can either bring a calculator with your on your walk, or create a customized "pace chart" with multiple distances already calculated out, so all you have to do is look up the pace for a given distance. A pace chart is extremely handy and a sample pace chart is shown above.

So now you know how many paces you need to walk for each leg of the course. A table of distances for each leg is provided at the end of this document. You will now be able to convert those distances to number of steps. But what direction do you walk?

Compass

Your compass will tell you what direction you need to walk. A table of directions, or "azimuths" is provided at the end of this document for each leg of the course here at Mills Park.

The following assumes you're using a mirror compass as shown earlier. Whatever compass you use, become familiar with its instructions.

Stand directly over your starting point marker. Dial the desired azimuth into the compass. Check it very carefully. Make sure you're not wearing any metal that can interfere with the compass, like a watch or necklace. Now hold the compass steady and at eye-level. Adjust the mirror angle so you can see the reflection of the compass bezel in the mirror of face. Rotate your hand so that the mirror line perfectly bisects the pivot point of the magnetic needle of your compass. Then, locking into that position, rotate your entire body so that the north pointing part of the needle (usually red) is perfectly centered in the orienting arrow. That's called putting "red in the shed." Now site a distant object in the targeting notch of your compass. That object is at your desired heading and so you will keep your eye on that object as you walk a straight line towards it. You can put your compass down now as you want to keep your eye on that object as you walk, don't walk looking at the compass.

Walking the Course

This course is laid out in the grass field by the pavilion. The boundaries of this course are the surrounding tree line (to the North, South, and West) and Bass Drive to the East. There are no markers outside of those bounds. If you walk outside of those bounds, you are off course! Refer to the map below.

All of the markers you'll be looking for are 2" orange domes in the ground with a number painted in black. On this course, there are no "dummy" or false markers to trick you. You may, however, see other nearby markers along the way.

Start this course on marker 1, which is about 36' west of the southwest corner of the pavilion parking lot. Standing directly over the marker and dial in your first azimuth, in this case 265°. Site a far away object along that azimuth and make note of it. You will walk directly towards that object.

Now determine the number of steps you need to walk to cover the distance specified, in this case 177 feet. Hopefully you'll have a pacing chart made from the pacing section. Now, start walking directly towards the far away object you sighted. Try not to get distracted as you count your pace and keep your eye on the target object. Imagine a straight line on the ground towards the object and just walk that line.

The markers are numbered sequentially 1 to 12, so you will know if you have found the correct marker because the number on it will be one greater than the marker you just left.

Ideally, after you've walked the entire number of steps your pacing chart tells you to walk for this distance, you will land directly on the marker. If not, and if you did everything right, you're probably very close, so start a search pattern looking for the marker.

Don't expect to be perfectly on the marker if this is new to you. After more and more practice, you'll find yourself getting closer and closer to the marker. If you don't find the marker, that's totally OK. Just go back to the starting point of the leg and start again double-checking your compass and your distance to pace conversion. Don't give up! This is a skill like any other skill and it needs to be practiced!

At the creation of this course, there were no obstacles on any of the legs, though there are nearby trees. However, there may end up being obstacles. This is overcome by using the technique referred to as boxing. Like boxing, there are other tricks you can learn, like shooting a reverse bearing, that will make your experience more interesting and fun. Those are beyond the scope of this small write up, but additional information and videos on this and other compass and orienteering topics can be found at: https://salinecountyss.wixsite.com/scss-compass

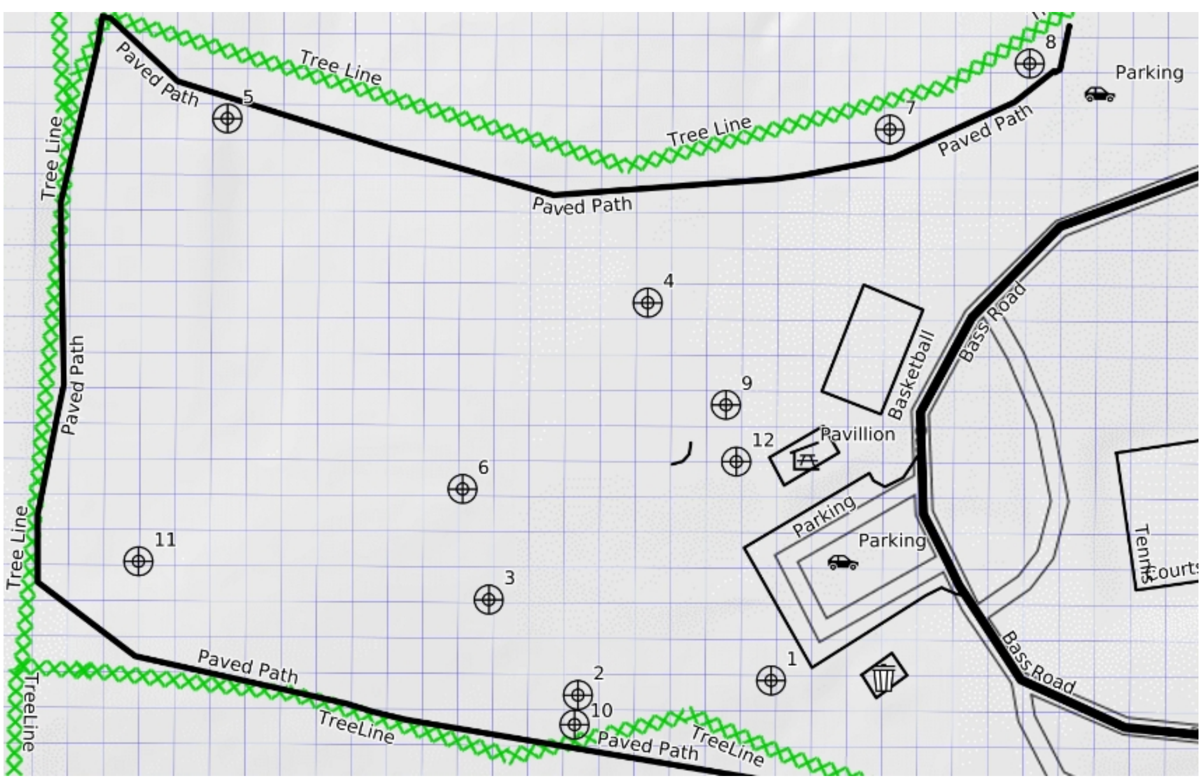
Mills Park Compass Course

Navigation Instructions. Print and take with you on the course.

All azimuths are based on True North and all lengths are in feet.

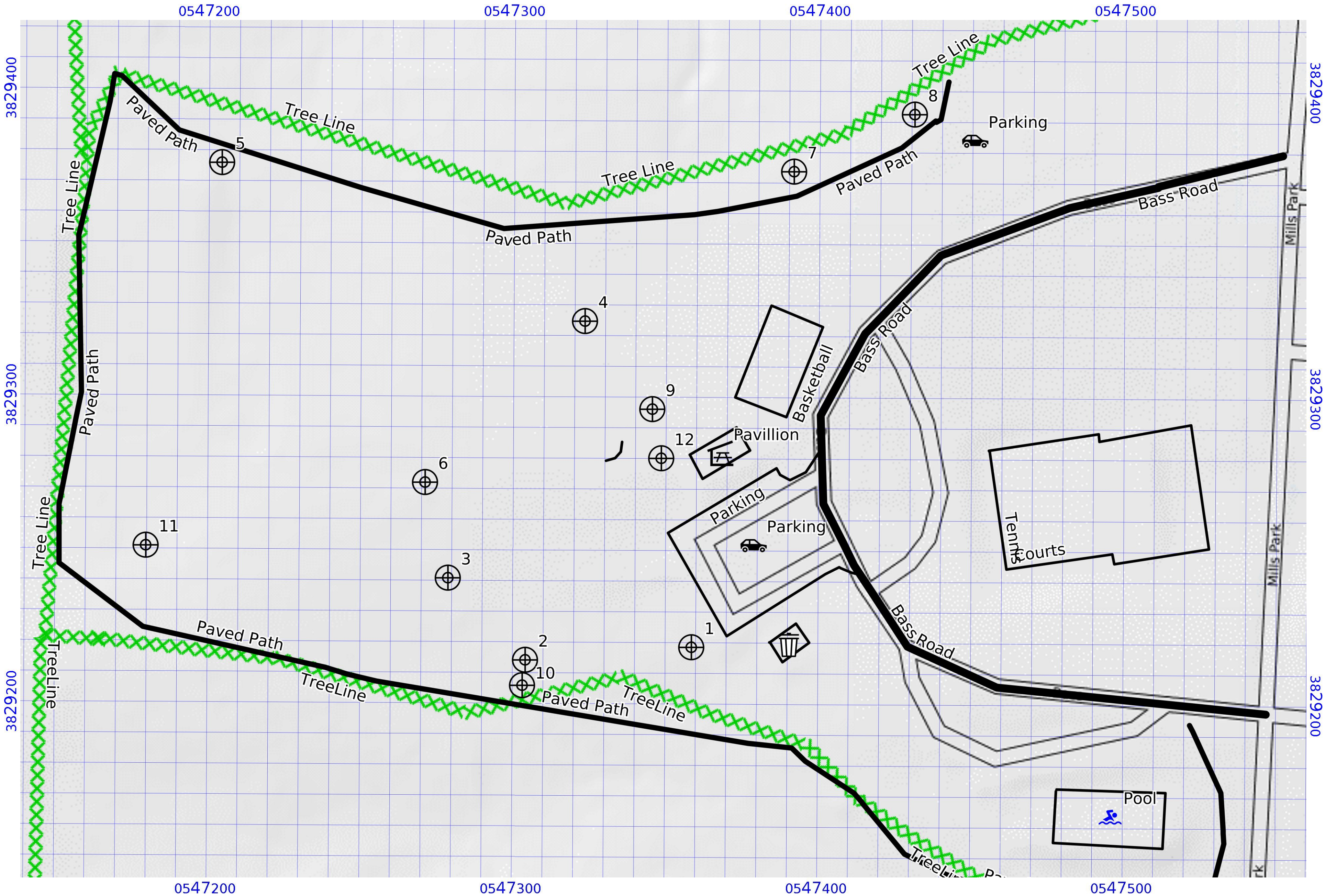
Start at Marker 1

Leg 1	Set 265° and walk 177 Feet	Marker Found:
Leg 2	Then set 317° and walk 120 Feet	Marker Found:
Leg 3	Then set 28° and walk 313 Feet	Marker Found:
Leg 4	Then set 294° and walk 425 Feet	Marker Found:
Leg 5	Then set 148° and walk 407 Feet	Marker Found:
Leg 6	Then set 50° and walk 518 Feet	Marker Found:
Leg 7	Then set 65° and walk 144 Feet	Marker Found:
Leg 8	Then set 221° and walk 423 Feet	Marker Found:
Leg 9	Then set 205° and walk 329 Feet	Marker Found:
Leg 10	Then set 291° and walk 433 Feet	Marker Found:
Leg 11	Then set 80° and walk 561 Feet	Marker Found:



NOTE: Compasses, always report "magnetic" directions, meaning the directions are relative to magnetic north equal to 0°. The Earth's magnetic field, and thus the poles of the Earth's magnetic field is constantly moving. The difference between the two is called "Magnetic Declination." At the time of this writing (2023), the location of Mills Park has a magnetic declination of 0.03°, so basically true north and magnetic north are in the same direction and no adjustment is necessary. If your compass has a magnetic declination adjustment, set it to 0° (at the time of this writing). Since magnetic north constantly changes, the magnetic declination always changes too, so in the future check online for the most current magnetic declination of Mills Park and set your compass declination adjustment to the most current magnetic declination for your area. Current magnetic declination can be found at https://www.magnetic-declination.com/

Brought to you courtesy of Saline County Shooting Sports



Mills Park Compass
WGS84
UTM Zone 15S
CALTOPO

0.1 0.2 0.3km

0.1 mi

Scale **1:1700** 1 inch = 142 feet

GN 0.3º
MN 0.0º