

Practicum Guide

Version 1.1

Table of Contents

Overview.....	3
Practicum 1.....	4
Practicum 2.....	5
Practicum 3.....	6
Practicum 4.....	7
Practicum 5.....	8
Practicum 6.....	9
Practicum 7.....	10
Practicum 8.....	11
Practicum 9.....	12
Practicum 10.....	13
References.....	14

Overview

The practicum section of the Turfgrass Science Invitational is designed to test the hands-on and observational skills of the participants in their preparation to demonstrate the skills needed to be successful in the golf course maintenance industry.

Practicums should be carried out in an area large enough to host all tables needed to display specimens & samples, as well as large and small equipment staged with space for students to move to each within the allotted time. Space for demonstration practicums should be chosen based on significant impact to space from repeated use of tools. Nursery greens that can handle probing, cutting, and traffic are ideal spaces.

- A. Participants will complete four rotations of identification stations that include:
 - a. Turfgrass Identification
 - b. Equipment Identification
 - c. Inputs Identification
 - d. Integrated Pest Management (IPM) Identification
- B. Participants will rotate in through 20 stations with specimens, equipment, and items displayed for each student to observe and identify. After each 20 minute rotation, students will move from one of the four areas to the next to complete all four identification practicums.
- C. Following the identification practicums, participants will complete 6 skill-based demonstrations that include:
 - a. Cup Cutting
 - b. Moisture Sensing
 - c. Soil Identification
 - d. Spreader calibration
 - e. Green Speed Measurement
 - f. Course Set-up
- D. Participants will have five minutes at each station to complete the task. Each participant will be observed by a judge who will use the rubric for each practicum to score the participant's ability to quickly, efficiently, and safely complete each task.
- E. Participants will turn in a recording card for identification stations and judges at demonstration stations will submit a score card to combine with the recording card to complete the practicum scorecard.
- F. Tie-breaker protocol is as follows:
 - a. First tie-breaker is highest score in Practicum 1 "Turfgrass Identification"
 - b. The second tie-breaker is the score during Practicum 8 "Spreader calibration"
 - c. Should a third tie-breaker be needed, the score for Practicum 5 "Cup Cutting" will be used to break remaining ties.

Practicum 1

(20 minutes)

Turfgrass Identification (50 points, 200 team points)

Participants will demonstrate efficient and accurate identification of warm season turfgrass, cool season turfgrass, and native plant types based on prepared knowledge.

- Each participant will be allowed 20 minutes to complete this phase
 - All specimens will be set out on tables for review.
 - Participants will rotate through each station at their own pace.
 - Participants will be allowed to study the specimen with Magnifying glass and may use forceps to manipulate a small sample of the specimen to inspect specific plant parts.
 - Participants will need to rotate through and identify all specimens by the conclusion of the 20 minutes.
- All tools and resources required for the practicum will be at the site
- The use of cell phones for this practicum will not be allowed

-Identify various types of plant materials found on the golf course-

For thousands of years, turfgrasses have been used as low growing groundcover with cultural, strategic, and sporting value. Modern turfgrass varieties have a myriad of uses including and not limited to the protection of the playing surface for golf. From construction to maintenance, selecting the best suited and appropriate grass for a specific area on the golf course is both a complicated and essential duty for a builder. Selecting the right turfgrass can save a superintendent countless hours of labor and significant amounts of money on inputs. Your challenge will be to identify warm-season, cool-season, and native turfgrass species.

Equipment Required:

- Magnifying glass
- Forceps
- Recording card

Grading:

Item	% of Practicum	Multiplier	Points
Identification of Warm Season Grass	40	x2	
Identification of Cool Season Grass	40	x2	
Identification of Native Plant Species	20		
Total			

Practicum 2

(20 minutes)

Equipment Identification (50 points, 200 team points)

Participants will demonstrate efficient and accurate identification of equipment used to maintain a golf course based on prepared knowledge.

- Each participant will be allowed 20 minutes to complete this phase.
 - All equipment will be set out for review.
 - Participants will rotate through each station at their own pace.
 - Participants will be allowed to study the equipment but will not be allowed to turn the equipment on, climb on, or operate any piece of equipment.
 - Participants will need to rotate through and identify all equipment by the conclusion of the 20 minutes.
- All tools and resources required for the practicum will be at the site.
- The use of cell phones for this practicum will not be allowed.

-Identify the Equipment Needed to Maintain a Golf Course-

The course conditions we enjoy today depend on highly specialized equipment. Things have come a long way since the days when sheep and rabbits handled the mowing. The equipment needed to maintain the grass on a modern golf course are extremely sharp, finely tuned, and constantly evolving. Additionally, highly specialized tools, vehicles, and instruments help Superintendents sustainably manage playing surfaces for the best golfer experience. Your challenge will be to identify every tool that is used to maintain a golf course.

Equipment Required:

- Recording card

Grading:

Item	% of Practicum	Multiplier	Points
Identification of Large Engine Equipment	25		
Identification of Small Engine Equipment	25		
Identification of Implements	15		
Identification of Hand Tools	20		
Identification of System Parts	15		
Total			

Practicum 3

(20 minutes)

Inputs Identification (50 points, 200 team points)

Participants will demonstrate efficient and accurate identification of inputs needed to maintain a golf course based on prepared knowledge.

- Each participant will be allowed 20 minutes to complete this phase
 - All inputs will be set out for review. (no inputs will be open)
 - Participants will rotate through each station at their own pace.
 - Participants will be allowed to study the inputs and the labels on each, but will not be allowed to open the input's container unless a sample is set out specifically for Participants to manipulate.
 - Manipulable samples will be noted with a sign.
 - Participants will need to rotate through and identify all inputs by the conclusion of the 20 minutes.
- All tools and resources required for the practicum will be at the site
- The use of cell phones for this practicum will not be allowed

-Identify primary types of inputs applied on a golf course-

There currently are around 15,000 courses in the United States, averaging about 150 acres. Every superintendent is focused on maintaining a quality playing surface while balancing the necessary water and chemical inputs, managing overall land use, coexisting with the surrounding natural environment and wildlife, and operating within local, state and sometimes federal guidelines. Many scientific innovations have changed how turfgrass maintenance is done and help to ensure a safe, sustainable, and satisfying playing surface for golf. Your challenge will be to identify inputs Superintendents use on a golf course.

Equipment Required:

- Recording card

Grading:

Item	% of Practicum	Multiplier	Points
Identification of Fertilizer types	20		
Identification of Fungicides	20		
Identification of Pesticides	20		
Identification of Herbicides	20		
Identification of Soil Amendments	20		
Total			

Practicum 4

(20 minutes)

Integrated Pest Management (IPM) Identification (50 points, 200 team points)

Participants will demonstrate efficient and accurate identification of insects, disease, and weeds found on a golf course using prepared knowledge.

- Each participant will be allowed 20 minutes to complete this phase
 - All specimens will be set out for review.
 - Participants will rotate through each station at their own pace.
 - Participants will be allowed to study the specimens but will not be allowed to open the specimen container unless a sample is set out specifically for Participants to manipulate.
 - Manipulable samples will be noted with a sign.
 - Participants will need to rotate through and identify all specimens by the conclusion of the 20 minutes.
- All tools and resources required for the practicum will be at the site
- The use of cell phones for this practicum will not be allowed

-Identify the various types of pests found on a golf course-

Golf course superintendents and their staff work diligently to provide the best playing conditions possible; however, proper course management today also requires not only maintaining turf, but also conserving natural resources and protecting the environment. The goal for any superintendent is to reduce and focus pesticide use, increase understanding of plant disease and insect pests, provide better plant resistance to both pest and climatic stresses, and improve overall management for the best playing surface possible. Your challenge will be to identify the pests that a superintendent may encounter and treat for through cultural and chemical strategies.

Equipment Required:

- Magnifying glass
- Forceps
- Recording card

Grading:

Item	% of Practicum	Multiplier	Points
Identification of Insects	35		
Identification of Diseases	35		
Identification of Weeds	30		
Total			

Practicum 5

(5 minutes)

Equipment Operation A (100 points, 400 team points)

Participants will demonstrate efficient and high-quality cutting of a new cup based on successful repair of the old cup and straightness of a new cup with a set pin.

- Each participant will be allowed 5 minutes to complete this phase
- All tools and resources required for the practicum will be at the site
- The use of cell phones for this practicum will not be allowed

-Cut a new cup for play on a green-

The most valuable areas of a golf course are the greens. Any activity that occurs on the greens should be the most meticulous, cautious and professional activity that transpires anywhere on the golf course. The cup at the bottom of the hole that measures 4.25 inches ensures that the golfer has a uniform and fair ending to the play of a golf hole. Your challenge is to change the location of a cup on a golf green.

Equipment Required:

- Cup Cutter
- Electrical tape
- Cup pulling tool & Cup setter
- Finishing sand
- Water bottle
- Roller

Grading:

Item	Superior Evidence of Skill (5-4)	Satisfactory Evidence of Skill (3-2)	Unsatisfactory Evidence of Skill (1-0)	Multiplier	Points
Identification of new pin location	Participant is able to follow pin sheet to quickly and efficiently step out location of new pin within 1-yard tolerance	Participant is able to follow pin sheet to step out location of new pin within 2-yard tolerance	Participant is unable to follow pin sheet to step out location of new pin within 2-yard tolerance		
Cut new cup	Participant is able to efficiently and safely use cup cutter to cut a new cup to within .25 inches of assigned depth with no damage to green	Participant is able to efficiently and safely use cup cutter to cut a new cup to within .5 inches of assigned depth with no damage to green	Participant is unable to efficiently and safely use cup cutter to cut a new cup to within .5 inches of assigned depth and/or causes damage to green	x2	
Replace & repair old cup	Participant is able to place new plug into the old cup hole flush surface to surrounding turf, apply sand to fill in any gap, and appropriate amount of water applied.	Participant is able to place new plug into the old cup hole nearly flush to surrounding turf, apply sand to fill in any gap, and appropriate amount of water applied	Participant is unable to place new plug into the old cup hole flush surface to surrounding turf, fails to apply sand to fill in any gap, and does not apply appropriate amount of water.	x2	
Professionalism	Participant operates quickly, safely, and efficiently with no damage to green	Participant operates quickly, safely, and efficiently with very little damage to green	Participant fails to operate quickly, safely, and efficiently with no damage to green		
Total					

Practicum 6

(5 minutes)

Equipment Operation B (100 points, 400 team points)

Participants will demonstrate efficient and accurate use of a moisture meter to assess soil moisture based on volumetric water content.

- Each participant will be allowed 5 minutes to complete this phase
- All tools and resources required for the practicum will be at the site
- The use of cell phones for this practicum will not be allowed

-Calculate Soil Moisture present on a golf course-

Moisture management is one of the most important aspects of bringing high performance turfgrass stands through dry periods. Too much moisture can lead to diseases, poor recovery, inconsistent performance, and susceptibility to pests. Too little moisture brings on wilt, higher canopy temperatures, and potential for more localized dry spot. A superintendent must track moisture to preserve turf and sustainably manage resources. Your challenge is to identify the moisture present in the soil in a target area.

Equipment Required:

- Field Scout Soil Moisture probe
- Marking Flag

Grading:

Item	Superior Evidence of Skill (5-4)	Satisfactory Evidence of Skill (3-2)	Unsatisfactory Evidence of Skill (1-0)	Multiplier	Points
Sampling sites	Participant selects at least 9 sampling sites that are equally spaced out within target site	Participant selects at least 5 sampling sites that are fairly spaced out within target site	Participant selects less than 5 sampling sites that are unequally spaced out within target site		
Average moisture value	Participant is able to quickly and efficiently calculate a grand average for volumetric water content based on readings within 5%	Participant is able to calculate a grand average for volumetric water content based on readings within 10%	Participant is unable to calculate a grand average for volumetric water content based on readings within 10%		
Flagged areas	Participant flags all areas that are significantly lower in volumetric water content than the grand average	Participant flags some areas that are significantly lower in volumetric water content than the grand average	Participant fails to flag any areas that are significantly lower in volumetric water content than the grand average		
Professionalism	Participant collects all data and flags dry areas without any disruption to the target area	Participant collects all data and flags dry areas without hardly any disruption to the target area	Participant causes disruption to the target area during data collection		
				Total	

Practicum 7

(5 minutes)

Interpretation & Analysis A (100 points, 400 team points)

Participants will demonstrate efficient and accurate identification of soil types based on a pulled core sample according to the soil texture and color.

- Each participant will be allowed 5 minutes to complete this phase
- All tools and resources required for the practicum will be at the site
- The use of cell phones for this practicum will not be allowed

-Identify the soil types present on a golf course-

Estimating or measuring soil texture provides valuable information about soil properties affecting plant growth. Soil texture affects the movement and availability of air, nutrients and water in a soil. Sampling soil and identifying texture quickly by hand can provide a Superintendent insight into drainage and a possible need for further analyzation. Your challenge is to identify the soil in a target area based on a texture analysis by hand.

Equipment Required:

- T-probe
- Wash bottle
- Soil texture triangle

Grading:

Item	Superior Evidence of Skill (5-4)	Satisfactory Evidence of Skill (3-2)	Unsatisfactory Evidence of Skill (1-0)	Multiplier	Points
Soil probe sampling	Participant is able to quickly and efficiently identify a site and push probe into the ground to safely collect a soil core	Participant is able to identify a site and push probe into the ground to safely collect a soil core	Participant is unable to quickly and efficiently identify a site and causes damage while pushing probe into the ground to collect a soil core		
Conducting soil identification tests	Participant is able to complete an efficient texture test by hand through an attempt to form a ball, ribbon, and smears soil sample between fingers	Participant is able to mostly complete a texture test by hand through an attempt to form a ball, ribbon, and smears soil sample between fingers	Participant is unable to complete a texture test by hand, forgetting most or all tests including formation of a ball, ribbon, and smears between fingers	x2	
Identification of soil	Participant is able to correctly identify the exact soil type according to location on soil texture triangle	Participant's response for soil type is no more than one class away from the correct soil type according to the soil texture triangle	Participant's response for soil type is outside of one class away from the correct soil type according to the soil texture triangle	x2	
Repair of collection site	Participant quickly and efficiently repairs the area around the site for the soil core retrieval to make it look like the site is undisturbed	Participant repairs the area around the site for the soil core retrieval to make it look like the site has been minimally disturbed	Participant is unable to repair the area around the site for the soil core retrieval to make it look like the site has been minimally disturbed		
Professionalism	Participant makes little to no mess and treats site and equipment with utmost respect	Participant makes minimal mess and treats site and equipment with utmost respect	Participant makes a significant mess and treats site and equipment with a lack of respect		
Total					

Practicum 8

(5 minutes)

Interpretation & Analysis B (100 points, 400 team points)

Participants will demonstrate an efficient and accurate calibration of a fertilizer spreader based on size and desired application rate for an area on a golf course.

- Each participant will be allowed 5 minutes to complete this phase
- All tools and resources required for the practicum will be at the site
- The use of cell phones for this practicum will not be allowed

-Measure an area and calibrate a spreader-

Spreaders must be properly calibrated if they are to deliver granular fertilizers and pesticides to turf at correct rates. If calibration is done incorrectly, the product may be misapplied, and either too much or too little of the product will reach the turf. In addition to calibration, a Superintendent must be able to calculate the correct amount of input to apply using a calibrated spreader. Your challenge will be to measure an area, calculate the amount of input needed to apply, and calibrate a spreader to apply the input.

Equipment Required:

- Walk-behind rotary push spreader
- Tarp
- Measuring wheel
- Recording card

Grading:

Item	Superior Evidence of Skill (5-4)	Satisfactory Evidence of Skill (3-2)	Unsatisfactory Evidence of Skill (1-0)	Multiplier	Points
Area Measurement	Participant quickly and efficiently uses measuring wheel to take just enough measurements to accurately calculate area without damaging turf	Participant uses measuring wheel to take measurements to roughly calculate area without damaging turf	Participant fails to quickly and efficiently use measuring wheel to take measurements to accurately calculate area without damaging turf	x2	
Calculation	Participant is able to calculate the area of the target area within 5% of actual measurement	Participant is able to calculate the area of the target area within 15% of actual measurement	Participant is unable to calculate the area of the target area within 15% of actual measurement	x2	
Calibration	Participant is able to quickly and efficiently calibrate the spread based on prescribed application rate to the exact letter	Participant is able to calibrate the spreader based on prescribed application rate within 2 letters of the actual letter	Participant is unable to calibrate the spreader based on prescribed application rate within 2 letters of the actual letter	x2	
Application	Participant makes an application of the input on the target area at the appropriate speed and with proper overlap after two passes	Participant makes an application of the input on the target area at a near appropriate speed and with close to proper overlap after two passes	Participant makes an application of the input on the target area at an inappropriate speed and/or with improper overlapping after multiple passes		
Professionalism	Participant finishes practicum within the time allotment and maintains a clean and safe work area	Participant finishes practicum within the time allotment and maintains a fairly clean and safe work area	Participant fails to finish practicum within the time allotment and does not maintain a clean and safe work area		
				Total	

Practicum 9

(5 minutes)

Playing Surface Set-up A (100 points, 400 team points)

Participants will demonstrate safe, efficient, and accurate completion of a task related to the setup of a playing surface for competition from the Playing Surface Set-up list.

- Each participant will be allowed 5 minutes to complete this phase
- All tools and resources required for the practicum will be at the site
- The use of cell phones for this practicum will not be allowed

-Measure green speed using a USGA Stimpmeter-

One of the most significant aspects of a golf course is the uniformity of its putting greens. Variations in speed, whether from one green to the next or on different parts of the same green, can negatively impact a golfer's round. Most golf course superintendents are well aware of this challenge, and constantly seek better ways to establish consistent speed on all putting greens. The Stimpmeter is a simple, accurate device to measure green speed. It has proven to be an invaluable asset to the game of golf, both for daily play and championship preparations, and a helpful management tool for the golf course superintendent. Your challenge will be to collect green speed data on a golf green.

Equipment Required:

- Stimpmeter
- Three golf balls
- Three tees
- 20-foot measuring tape
- Recording card

Grading:

Item	Superior Evidence of Skill (5-4)	Satisfactory Evidence of Skill (3-2)	Unsatisfactory Evidence of Skill (1-0)	Multiplier	Points
Site Selection	Participant chose three flat areas for roll test that provided ample space for entire length of ball roll	Participant chose at least 2 flat areas for roll test that provided ample space for entire length of ball roll	Participant chose only 1 or no flat areas for roll test and did not find ample space for the ball roll	x2	
Ball Roll	Participant lifted Stimpmeter at the appropriate speed and ball rolled off ramp with little to no bounce during every test	Participant lifted Stimpmeter at the appropriate speed and ball rolled off ramp with very little bounce during most every test	Participant inconsistently lifted Stimpmeter and ball rolled off ramp with significant bounce during many tests rolls	x2	
Measurement	Participant measures ball roll from tee to tee after a down & back roll series and repeats process three times	Participant measures ball roll from tee to tee after a down & back roll series and repeats process at least 2 times	Participant fails to measure ball roll from tee to tee, inconsistently uses a down & back roll series, and fails to repeat process	x2	
Data Reporting	Participant reports an average green speed that is within 10% of the actual green speed	Participant reports an average green speed that is within 15% of the actual green speed	Participant reports an average green speed that is beyond 15% above or below the actual green speed	x3	
Professionalism	Participant collects data efficiently within time allotment and with no damage to the playing surface	Participant collects data somewhat efficiently within time allotment and with no damage to the playing surface	Participant fails to collect data efficiently within time allotment and inflicts damage to the playing surface		

Total	
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Practicum 10

(5 minutes)

Playing Surface Set-up B (100 points, 400 team points)

Participants will demonstrate safe, efficient, and accurate completion of a task related to the setup of a playing surface for competition from the Playing Surface Set-up list.

- Each participant will be allowed 5 minutes to complete this phase
- All tools and resources required for the practicum will be at the site
- The use of cell phones for this practicum will not be allowed

-Set-up Tee Markers-

Golf course superintendents rotate tee markers on a regular basis to help turf on teeing grounds recover from traffic and give divots time to heal. Whether they move forward, backward, right or left, moving tee markers not only impacts turf health, it has a direct impact on a round of golf. When the maintenance staff moves the tee markers on each hole, they must think about how the tee marker locations on all 18 holes affect the course yardage for each set of tees. Increasing or decreasing the total yardage from a set of tees by more than 22 yards for men and 18 yards for women will alter the USGA Course Rating™ by one-tenth of a stroke or more. Your challenge will be to set a new location for tee markers.

Equipment Required:

- Tee Blocks (2)
- Sand Box
- Trowel
- T-Square

Grading:

Item	Superior Evidence of Skill (5-4)	Satisfactory Evidence of Skill (3-2)	Unsatisfactory Evidence of Skill (1-0)	Multiplier	Points
Site Selection	Participant is able to quickly identify the next ideal location to move the tee blocks to based on specific attention to traffic mitigation	Participant is able to identify the next ideal location to move the tee blocks to based on some attention to traffic mitigation	Participant is unable to identify an ideal location to move the tee blocks to based on some attention to traffic mitigation	x2	
Alignment	Participant is able to quickly align tee blocks to be perfectly perpendicular to the direction of the golf hole	Participant is able to align tee blocks to be very perpendicular to the direction of the golf hole	Participants is unable to align tee blocks to be perpendicular to the direction of the golf hole	x2	
Uniformity	Participant sets tee blocks exactly equal distance away from center of tee box	Participant sets tee blocks fairly equal distance away from center of tee box	Participant sets tee blocks unequally away from center of tee box	x2	
Divot Repair	Participant identifies divot to repair and fills it to appropriate level based on ground surface	Participant identifies divot to repair and fills it to near appropriate level based on ground surface	Participant fails to identify divot to repair and/or fills it to an inappropriate level based on ground surface	x3	
Professionalism	Participant sets tees efficiently	Participant sets tees within time	Participant fails to set tees within		

	within time allotment and with no damage to the playing surface	allotment and with no damage to the playing surface	time allotment and/or damages the playing surface		
Total					

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