NTSI 2027



Practicum Guide

Version 1.1

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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.

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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 3 identification-based practicums:
    a. Turfgrass Identification
    b. Equipment Identification
    c. Integrated Pest Management (IPM) Identification
B. Participants will rotate through samples within each practicum with specimens, equipment, and items displayed for each student to observe and identify. After 10 minutes, students will move to the next practicum until they complete all four identification practicums within 30 minutes.
C. Following the identification practicums, participants will rotate through 5 skill-based pacticums that include:
    a. Green Speed Measurement
    b. Moisture Sensing
    c. Cup Cutting
    d. Soil Identification
    e. Sprayer Calibration
D. Participants will have 10 minutes at each practicum 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 "sprayer calibration"
    c. Should a third tie-breaker be needed, the score for Practicum 5 "Cup Cutting" will be used to break remaining ties.

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Practicum Layout



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Practicum 1 - Green Speed

(10 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 10 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. Golf course superintendents 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
- ☐ Golf balls (3)
- ☐ Tees (3)
- ☐ 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 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 collects data efficiently within time allotment and inflicts damage to the playing surface		
				Total	

Practicum 2 - Soil Moisture

(10 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 10 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 (4)
- ☐ Marking Flags (10)

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 collect data from all sampling sites that are equally spaced out within target site	Participant collect data from nearly all sampling sites that are spaced out within target site	Participant fails to collect samples from most of the sampling sites that are 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 notes all areas that are significantly lower in volumetric water content than the grand average	Participant notes some areas that are significantly lower in volumetric water content than the grand average	Participant notes 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	

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Practicum 3 - Equipment ID

(10 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 10 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	

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Practicum 4 - IPM ID

(10 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 10 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 using a hand lens and can pinch out a small sample.
    - 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	

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Practicum 5 - Turf ID

(10 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 10 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	

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Practicum 6 - Cup Cutting

(20 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 20 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 mark pin sheet and both quickly and efficiently step out location of new pin within 1-yard tolerance	Participant is able to mark a pin sheet and step out location of new pin within 2-yard tolerance	Participant is unable to mark pin sheet and 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					

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Practicum 7 - Soil Sampling

(10 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 10 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
- ☐ Soil Testing Box

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 to correctly identify the exact soil type	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 to identify the soil type to within one class of the type	Participant is unable to complete an texture test by hand, forgetting most or all tests including formation of a ball, ribbon, and smears between fingers, incorrectly identifying the soil type	x2	
Preparation of Soil Test	Participant is able to collect the ideal amount of soil for a sample, place in box, and complete accompanying soil test form with all required information	Participant is able to collect an adequate soil sample, place in box, and complete accompanying soil test form with nearly all required information	Participant is unable to collect an adequate soil sample, place in box, and is unable to complete accompanying soil test form with all required information	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	

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Practicum 8 - Sprayer Calibration

(20 minutes)
Equipment Operation (100 points, 200 team points)
Participants will demonstrate efficient and accurate calibration and set-up of a boom sprayer for an input application.

- Each participant will be allowed 20 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.

-Calibrating your boom sprayerer for an application-

Using a boom spraying makes the application of flowable inputs both easy and precise. To ensure a safe and accurate application however, the mechanism for application must be calibrated to deliver the exact amount intended per area of interest. From speed to amount/minute, each component of the spray rig must be evaluated. Your challenge will be to calibrate a spray rig according to the rates directed by the label for a specific input needed for application on a football field.

Equipment Required:

- ☐ Measuring pitcher
- ☐ Measuring tape
- ☐ Pencil & paper
- ☐ Calculator

Grading:

Item	Superior Evidence of Skill (5-4)	Satisfactory Evidence of Skill (3-2)	Unsatisfactory Evidence of Skill (1-0)	Multiplier	Points
Nozzle type identification	Correct nozzle is identified with all pertinent information included to communicate type and use	Correct nozzle is identified with some pertinent information included to communicate type and use	Correct nozzle is not identified and pertinent information to communicate type and use are missing		
GPM calculation	Gallons per minute are calculated within .5 gallons of actual application amount during demo	Gallons per minute are calculated within 1.5 gallons of actual application amount during demo	Gallons per minute are calculated outside of 2 gallons of actual application amount during demo	x2	
Problem layout	Application problem based on nozzle type and desired rate is laid out; demonstrating familiarity and mastery of calculation needed	Application problem based on nozzle type and desired rate is laid out; demonstrating some familiarity of calculation needed	Application problem based on nozzle type and desired rate is not laid out; demonstrating a lack of familiarity and mastery of calculation needed		
Problem solution	Problem solution is within 5% of correct application answer	Problem solution is within 6-10% of correct application answer	Problem solution is outside of 10% of correct application answer	x2	
Professionalism	All materials are handled safely and no wear is inflicted	All materials are handled safely and very little wear is inflicted	Not all materials are handled safely and damage is inflicted		
				Total	

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