

16th Annual Collegiate Turf Bowl Competition Study Guide

GCSAA would like to thank Leah Brilman, Ph.D., a member of the Turfgrass Breeders Association and Gwen Stahnke, Ph.D., facilitators of the Turf Bowl, for their work in updating and modifying the exam each year.

The Turf Bowl consists of an exam in eight parts, including a physical and visual identification of samples, multiple choice, fill-in-the-blank, essay and matching questions.

A list of resources to study for this portion of the exam is included at the bottom. We also recommend going out to local superintendents, chapters or alumni for their help in preparing for the case study/essay section.

Turfgrass Identification

- Identify live turf specimens and seed specimens by their common names.
- Know common name vs. scientific name.
 - For specific turfgrass species, please see Addendum 1.

Turfgrass Growth and Development

- Identify parts of the grass plant.
- Know management and environmental factors that influence growth.
- Understand turfgrass physiology and how it is influenced by management practices.

Turfgrass Soils and Soil Fertility

- Know greens construction, particle sizes, soils and fertility.
- Know of macronutrients and micronutrients, and their influence on growth.

Weed Identification and Control

- Identify common weeds.
- Know herbicides, what weeds they control and mode of action.
- Know the life cycle of weeds and how management influences weed growth.
- Know seed labeling for crops and weeds.
- For specific weeds, please see Addendum 2.

Turfgrass Diseases

- Identify common diseases on turf stands.
- Know environmental and management conditions, and the types of diseases that the conditions favor.
- Know common fungicides.
- Know grass species corresponding to various diseases.

Turfgrass Mathematics

- Calculate application rates of chemicals and fertilizers.
- Know quantities of sand and seed to use.

- Know how to correctly calibrate application equipment.

Turfgrass Insects

- Identify specimens of larval and adult forms of insects that attack turf.
- Know life cycles, preferred foods, feeding methods and other characteristics important in controlling insects.

Business Management (multiple-choice section)

- Equal Employment Opportunity Commission Guidelines
- Steps in the accounting process
- Total assets
- Retained earnings
- Total liabilities
- Capital stock
- Projection
- Depreciation
- Amortization
- Capitalization
- Types of leases
- Leasing/ purchasing
- Liquidity ratio
- Solvency ratio
- Profitability ratio
- Operations ratio

Business Management (case study section)

- The essay will be graded on **analysis** of the issue, development of an **action plan**, and **justification** of the action plan.
 - Provide insightful analysis of the problem, identifying relevant issues.
 - Present a plan to solve the problem.
 - Justify in a clear and concise manner your support for the action plan.
- Students will have 30 minutes to write for one of the following scenarios. Only one of the scenarios will be selected to address.
- Again, students are **strongly encouraged** to seek out local superintendents, chapters or alumni to help them research their answers to these real-world scenarios. Valuable information may also be found in member sections of www.gcsaa.org and on www.eifg.org.

Case Study –

The Joshua Tree Golf Course

This city-owned, 18-hole course is located in southern California and was established in 1987. The course is situated on 150 acres, with 25 acres of fairway and 65 acres of rough. Greens average slightly more than 8,000 square feet and tees between 5,000 and 7,000 square feet. Greens and tees are predominantly *Poa annua* with Ryegrass fairways. Rounds per year are 30,000. In 1999, the course started using effluent water as its primary irrigation source.

The superintendent, Bon O. Driver, CGCS, has been with the course for 15 years. The crew of 10, including one assistant superintendent and one equipment technician, are union, city employees. Most of the crew has been employed at the golf course for over 10 years.

Approved Budget for 2010:

Operating		Capital	
Payroll	\$440,000	Golf Course	\$ 30,000
Fertilizer/Chemicals	80,000	Buildings/Grounds	15,000
Water Pump/Backup	35,000	Equipment	12,000
Seed	15,000	Total:	\$ 57,000
Repairs/Maintenance	15,000		
Supplies	10,000		
Outside Services	8,000		
Rentals	15,000		
Total:	\$618,000		

Scenarios

Scenario 1 - Due to several years of drought, the city has implemented water restrictions for all home owners and businesses. However, because the golf course uses effluent water for its irrigation, these restrictions are not applicable to the course. Many members of the community have complained to the local media about the seemingly constant irrigation occurring on the course. The media is putting pressure on city officials for an explanation. The head of the Parks and Recreation department has asked Bon to handle the situation. Develop a brief but thorough message explaining the situation and detail the distribution plan for delivering the message.

Scenario 2 - Last year, the golf course's eastern boundary was threatened by a wildfire. Before this year's wildfire season, city officials want to make sure that the golf course has a disaster emergency plan in place. Develop a comprehensive emergency plan for the golf course, including how the course can be used to aid the city in such an emergency. Be sure to detail the steps and resources used in the process.

Scenario 3 - Two of the crew members recently have not been getting along. One of crew members has filed a grievance against the other for threatening physical violence. Outline Bon's plan for mediating the grievance between the two crew members.

Scenario 4 - Due to budget concerns, the head of the Parks and Recreation department is asking Bon to skip a planned fertilizer application for the fairways and roughs. Develop a response explaining the long term consequences (positive or negative) of this demand, keeping in mind that the audience reviewing the response is city officials.

Resources

The following resources, along with GCSAA's monthly publication *Golf Course Management* magazine, are recommended as study resources. The textbooks may be available through your school library, local bookstore or through the **GCSAA Store online at store.gcsaa.org or by calling (800) 472-7878.**

1. **The Mathematics of Turfgrass Maintenance** (*Third Edition*) – Michael Agnew and Nick Christians
2. **Mathematics for the Green Industry: Essential Calculations for Horticulture and Landscaping Professionals** - Michael Agnew, Nancy Agnew, Ann Marie VanDerZanden and Nick Christians
3. **Turfgrass Management** (*Fifth or Sixth Edition*) – A.J. Turgeon
4. **Fundamentals of Turfgrass Management** – Nick Christians
5. **Turf Management for Golf Courses** (*2 nd Edition*) – James B. Beard

6. **Salt-Affected Turfgrass Sites: Assessment and Management** – R.N. Carrow and R.R. Duncan
7. **Managing Turfgrass Pests** – Thomas L. Watschke, Peter H. Dernoden and David J. Shetlar
8. **Controlling Turfgrass Pests (2nd Edition)** – Thomas W. Fermanian, Malcom C. Shurtleff, Roscoe Randell, Henry T. Wilkinson and Philip L. Nixon
9. **Creeping Bentgrass Management: Summer Stresses, Weeds and Selected Maladies** – Peter H. Dernoden
10. **Human Resource Management for Golf Course Superintendents, ch. 6** – Bob Milligan and Tom Maloney
11. **Superintendents Handbook of Financial Management, ch. 2, 3, 5, and 9** – Ray Schmidgall
12. **The Turf Problem Solver: Case Studies and Solutions for Environmental, Cultural and Pest Problems** – A.J. Turgeon and J.M. Jr. Vargas (Dec. 2, 2005)
13. **Identifying Turf and Weedy Grasses of the Northern United States** – D. Pedersen and T. Voight Illinois Pocket ID series University of Illinois Extension
<http://www.pubsplus.uiuc.edu>
14. **Turfgrass Identification Tool – Purdue University Turfgrass Science Department of Agronomy** (vernation) -
<http://www.agry.purdue.edu/turf/tool/index.html>
15. **Turfgrass Identification** (vernation)- David Gardner, The Ohio State University
http://buckeyeturf.osu.edu/pdf/01_turfgrass_identification.pdf

If you have any questions about the competition, please contact Diana Kern at (800) 472-7878 ext. 3600.

Addendum I

Cool Season Grasses

Common name

1. Kentucky bluegrass
2. Perennial ryegrass
3. Tall fescue

4. Hard fescue
5. Chewings fescue
6. Creeping bentgrass
7. Colonial bentgrass
8. Strong creeping red fescue
9. Slender creeping red fescue
10. Velvet bentgrass
11. Rough bluegrass
12. Annual bluegrass
13. Annual ryegrass

Scientific name

Poa pratensis
Lolium perenne
Schedonorus arundinaceus = *Lolium arundinaceum*
(formerly *Festuca arundinacea*)
Festuca brevipila (*F. trachyphylla*)
Festuca rubra ssp. *commutata* (ssp. *fallax*)
Agrostis stolonifera
Agrostis capillaris
Festuca rubra ssp. *rubra*
Festuca rubra ssp. *litoralis*
Agrostis canina
Poa trivialis
Poa annua
Lolium multiflorum

Warm Season grasses

14. Japanese / Korean lawngrass
15. Manilla grass
16. Hybrid bermudagrass
17. Common bermudagrass
18. Centipedegrass
19. Seashore paspalum
20. Buffalograss
21. St. Augustinegrass
22. Kikuyugrass
23. Bahiagrass

Zoysia japonica
Zoysia matrella
Cynodon dactylon X *C. transvaalensis*
Cynodon dactylon
Eremochloa ophiuroides
Paspalum vaginatum
Buchloe dactyloides
Stenotaphrum secundatum
Pennisetum clandestinum
Paspalum notatum

Addendum 2

Bahiagrass
Barnyardgrass / Watergrass
Bedstraw / Catchweed
Bentgrass, Creeping
Bermudagrass
Bindweed, Field
Bluegrass, Annual
Bluegrass, Rough
Buttonweed , Virginia
Carpetweed
Carrot, Wild
Chickweed, Common
Chickweed, Mouseear
Chicory
Clover, White
Crabgrass, Hairy (Large)
Crabgrass, Smooth
Cudweed, purple
Dallisgrass (smooth paspalum)
Dandelion
Dandelion, False /spotted catsear
Dock, Curly
Downy Brome / cheatgrass
English Daisy
Fescue, Tall
Foxtail, Yellow (pigeon / bristle grass)
Garlic , Wild
Geranium, Carolina / dovefoot
Goosegrass/Silver Crab/ Crowfoot
Foxtail , Green
Ground Ivy (Creeping Charlie/Jenny)
Hawkweed
Henbit
Johnsongrass
Kikuyugrass
Knotweed, Prostrate / Common
Kochia
Kyllinga, Annual / Fragrant
Kyllinga, Green / Perennial
Lambsquarter
Lettuce , Prickly
Mallow, Common
Medic, Black
Moss, silvery thread
Mullein, Common
Nimblewill
Nutsedge, Purple
Nutsedge, Yellow
Oats, Wild
Orchardgrass
Pearlwort

Paspalum notatum
Echinochloa crus-galli
Galium aparine
Agrostis stolonifera (palustris)
Cynodon dactylon
Convolvulus arvensis
Poa annua
Poa trivialis
Diodia virginia
Mollugo verticillata
Daucus carota
Stellaria media
Cerastium vulgatum
Cichorium intybus
Trifolium repens
Digitaria sanguinalis
Digitaria ischaemum
Gnaphalium purpureum
Paspalum dilatatum
Taraxacum officinale
Hypochoeris radicata
Rumex crispus
Bromus tectorum
Bellis perennis
Schedonorus arundinaceus (Festuca)
Setaria glauca (pumilla ssp pumilla)
Allium vineale
Geranium ssp.
Elusine indica
Setaria viridis
Glechoma hederacea
Hieracium pratense
Lamium amplexicaule
Sorghum halapense
Pennisetum clandestinum
Polygonum aviculare
Kochia scoparia
Kyllinga odorata
Kyllinga brevifolia
Chenopodium album
Lactuca serriola
Malva neglecta
Medicago lupulina
Bryum argenteum
Verbascum thapsus
Muhlenbergia schreberi
Cyperus rotundus
Cyperus esculentus
Avena fatua
Dactylis glomerata
Sagina apetala (procumbens)

Pennywort / dollarweed
Peppergrass/ pepperweed
Pigweed, Prostrate
Pineapple Weed / wild chamomile
Plantain, Broadleaf
Plantain, Buckhorn / Narrowleaf
Puncture Vine / goatshead
Purslane, common
Quackgrass
Redtop
Ryegrass, Annual (Italian)
Salsify, Western
Sandbur/ grassbur
Sedge, Annual
Shepherd's Purse
Signalgrass
Smartweed, Spotted (Ladysthumb)
Smutgrass
Sorrel, Red / Sheeps
Speedwell, corn
Speedwell, creeping
Spurge, Prostrate / Spotted
Star of Bethlehem
Strawberry, Wild
Thistle, Bull
Thistle, Canada
Thistle, Musk
Torpedograss
Velvetgrass, German
Violet
Woodsorrel , Creeping
Woodsorrel, Yellow (Oxalis)
Yarrow

Hydrocotyle umbellata
Lepidium virginicum
Amaranthus blitoides
Matricaria discoidea
Plantago major
Plantago lanceolata
Tribulus terrestris
Portulaca oleracea
Elytrigia repens
Agrostis gigantea (alba)
Lolium multiflorum
Tragopogon dubius
Cenchrus incertus
Cyperus compressus
Capsella bursa-pastoris
Urochloa subquadripara
Polygonum persicaria
Sporobolus indicus
Rumex acetosella
Veronica arvensis
Veronica filiformis
Chamaesyce maculata (Euphorbia)
Ornithogalum umbellatum
Fragaria virginiana
Cirsium vulgare
Cirsium arvense
Carduus nutans
Panicum repens
Holcus mollis
Viola ssp.
Oxalis corniculata
Oxalis stricta
Achillea millefolium