

Course Title: Sports Turfgrass Production and Management

Unit: 1	Career Opportunities
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Content Standard(s) and Depth of Knowledge Level(s):	<p>Students will:</p> <ol style="list-style-type: none"> 1. Describe job characteristics in various career opportunities in the sports turf industry.
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Learning Objective(s) and Depth of Knowledge Level(s):	<p>Students will:</p> <ol style="list-style-type: none"> 1. Research and identify jobs that relate to the turf industry. 2. Discuss educational requirements for different jobs in the industry. 3. Discuss working conditions. 4. Fill out job applications and write résumés. 5. Discuss the history of the turf industry. 6. Discuss how knowledge of the turf industry can be used to make a living. 7. Identify skills that are used in the turf industry.
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Essential Question(s):	<p>How has the turfgrass industry changed in America over the last 10 years? What jobs are available to someone who is interested in the turfgrass industry?</p>
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Content Knowledge	Suggested Instructional Activities Rigor & Relevance Framework (Quadrant)	Suggested Materials, Equipment and Technology Resources
<ol style="list-style-type: none"> I. Turfgrass knowledge requirements II. Industry education requirements III. Business management skills IV. Applications and resumes V. Industry research 	<p>Lecture Demonstration Student practice Guest speaker Group assignment Individual assignments (research and presentations)</p>	<p>Textbook PowerPoint Presentation Computer/projector Industry magazines Worksheets</p>

Unit Assessment:	Written test and presentation on careers
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Unit/Course CTSO Activity:	Students will participate in Career Development Events and Personal S.A.E
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Unit/Course Culminating Product:	Students will participate in Career Development Events and Personal S.A.E
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Course/Program Credential(s): <input checked="" type="checkbox"/> Credential <input type="checkbox"/> Certificate <input type="checkbox"/> Postsecondary Degree <input checked="" type="checkbox"/> University Degree <input type="checkbox"/> Other:

Course Title: Sports Turfgrass Production and Management

Unit: 2	Safety
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Content Standard(s) and Depth of Knowledge Level(s):	Students will: 2. Identify workplace safety precautions for turfgrass personnel.
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Learning Objective(s) and Depth of Knowledge Level(s):	Students will: 1. Research and discuss safe handling of pesticides. 2. Determine how to properly dispose of pesticide containers. 3. Demonstrate how to properly operate turfgrass equipment. 4. Demonstrate correct procedures for handling and applying fertilizers. 5. Evaluate effects of pesticides and fertilizers in the land in terms of runoff and non-point source pollution. 6. Learn what personal protection equipment must be worn when handling pesticides and fertilizers, and operating machines. 7. Demonstrate applicator calibration procedures for correct application rates to prevent pollution.
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Essential Question(s):	Why is it extremely important for pesticide applicators to follow labels for application when applying pesticides to turf?
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Content Knowledge	Suggested Instructional Activities Rigor & Relevance Framework (Quadrant)	Suggested Materials, Equipment and Technology Resources
I. Pesticide labels II. Pesticide application/applicators III. Fertilizer labels IV. Fertilizer application procedures V. Equipment operation safety PPE for handling pesticides, fertilizers, and operating equipment. VI. MSDS VII. Applicator calibration	Lecture Demonstration Student practice Guest speaker Group assignment Individual assignments Sprayer and spreader calibration practice	Textbook PowerPoint Presentation Computer/projector Material Safety Data Sheets Worksheets Examples of PPE Sprayers Spreaders Equipment

Unit Assessment:	Written test and demonstration of correct application procedures
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Unit/Course CTSO Activity:	Nursery/ Landscape CDE
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Unit/Course Culminating Product:	Safety walk-through
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Course/Program Credential(s): <input checked="" type="checkbox"/> Credential <input type="checkbox"/> Certificate <input type="checkbox"/> Postsecondary Degree <input checked="" type="checkbox"/> University Degree <input type="checkbox"/> Other:

Course Title: Sports Turfgrass Production and Management

Unit: 3	Turfgrass Growth
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Content Standard(s) and Depth of Knowledge Level(s):	<p>Students will:</p> <ol style="list-style-type: none"> 3. Identify common names, characteristics, and uses of warm- and cool-season perennial grasses. <ul style="list-style-type: none"> ○ Categorizing climatic regions of the United States to determine suitable grasses Examples: Region 1- Kentucky bluegrass Region 2- Bermuda grass 4. Differentiate among the growth patterns of turfgrasses, including rhizome, stolon, and bunch. 5. Explain soil preparation techniques needed during turfgrass renovations. <ul style="list-style-type: none"> Examples: grading, draining, fertilizing ○ Describing the components of soils and the importance of each to the turfgrass industry ○ Describing methods of establishing turfgrass Examples: seeding, sodding, plugging, sprigging
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Learning Objective(s) and Depth of Knowledge Level(s):	<p>Students will:</p> <ol style="list-style-type: none"> 1. Identify common turfgrasses used on sports field and lawns, warm- and cool-season. 2. Compare characteristics of common turfgrasses, warm- and cool- season 3. Determine which grasses grow better in different regions of the country. 4. Identify and compare the turfgrass growth characteristics for warm-and cool-season grasses. 5. Prepare an area using soil preparation techniques in order to establish and renovate turfgrass areas. 6. Compare and contrast the different types of establishing turfgrasses. 7. Determine why the turfgrass industry is so important to our soils.
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Essential Question(s):	<p>Why must a sports field be renovated periodically to maintain a superior turfgrass?</p>
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Content Knowledge	Suggested Instructional Activities Rigor & Relevance Framework (Quadrant)	Suggested Materials, Equipment and Technology Resources
I. Warm season grass names II. Warm season grass characteristics III. Uses of warm season grasses IV. Cool season grass names V. Cool season grass characteristics VI. Uses of cool season grasses	Lecture Demonstration Student practice Guest speaker Group assignment Individual assignments	Textbook PowerPoint Presentation Computer/projector Worksheets Soil renovation tools Examples of grasses Examples of establishment methods

<p>VII. Climatic regions</p> <p>VIII Growth patterns</p> <p> A. Rhizome</p> <p> B. Stolon</p> <p> C. Bunch</p> <p>IX. Soil preparation techniques</p> <p>X. Turfgrass establishment methods</p> <p> A. Seeding</p> <p> B. Sodding</p> <p> C. Plugging</p> <p> D. Sprigging</p>	<p>Plant identification</p>	
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<p>Unit Assessment:</p>	<p>Written test, plant identification test, and group activity on renovation</p>
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<p>Unit/Course CTSO Activity:</p>	<p>Horticultural related CDEs</p>
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<p>Unit/Course Culminating Product:</p>	<p>Field trip to visualize what a well-kept sports field looks like versus one that is not.</p>
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<p>Course/Program Credential(s): <input checked="" type="checkbox"/> Credential <input type="checkbox"/> Certificate <input type="checkbox"/> Postsecondary Degree <input checked="" type="checkbox"/> University Degree</p> <p><input type="checkbox"/> Other:</p>
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Course Title: Sports Turfgrass Production and Management

Unit: 4 Turfgrass Management

Content Standard(s) and Depth of Knowledge Level(s):

Students will:

6. Evaluate the results of a soil analysis.
 - Comparing characteristics of primary and secondary macronutrients and micronutrients
Examples: primary macronutrients – nitrogen, phosphorus, potassium
secondary macronutrients – calcium, sulfur, magnesium
micronutrients- carbon, hydrogen, oxygen, iron, boron, manganese, copper, zinc, molybdenum, chlorine
 - Describing symptoms of deficiencies in turfgrasses
7. Identify insects, diseases, and weeds that affect specific turfgrasses.
Examples: insects- army worms, grubs, mole crickets
diseases- dollar spot, fairy ring
weeds- crabgrass, annual bluegrass
8. Differentiate among various types of pesticides.
Examples: preemergence, postemergence, selective and nonselective monosodium methanearsonate (MSMA)
 - Describing techniques for preparing pesticide mixtures
 - Demonstrating safe use of pesticides
9. Explain mowing heights, frequency of mowing, and patterns of mowing for use on various turfgrasses.

Learning Objective(s) and Depth of Knowledge Level(s):

Students will:

1. Take a soil sample and send it off for analysis.
2. Evaluate the results and make a fertilization schedule.
3. Identify macronutrients and micronutrients.
4. Calibrate fertilizer spreader.
5. Apply nutrients to turfgrass.
6. Identify nutrient deficiencies in turfgrasses.
7. Identify and treat common weed insects.
8. Identify and treat turfgrass diseases.
9. Identify and treat turfgrass weeds.
10. Compare various types of pesticides for the specific applications.
11. Calibrate a sprayer.
12. Safely mix a pesticide and apply.
13. Evaluate different mowing heights and patterns for turfgrasses.

Essential Question(s):	Why is proper management of an established turfgrass important for keeping it looking good?
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Content Knowledge	Suggested Instructional Activities Rigor & Relevance Framework (Quadrant)	Suggested Materials, Equipment and Technology Resources
I. Taking soil samples II. Reading soil samples III. Macronutrients A. Primary B. Secondary IV. Micronutrients V. Turfgrass nutrient deficiencies VI. Fertilizer applicators VII. Fertilizer application rates VIII. Turfgrass insects IX. Turfgrass weeds X. Turfgrass diseases XI. Types of turfgrass pesticides A. Preemergence B. Postemergence C. Selective D. Nonselective XII. Pesticide handling, mixing, and disposal XIII. Pesticide application procedures XIV. Mowing heights XV. Mowing frequency XVI. Mowing patterns	Lecture Demonstration Student practice Guest speaker Group assignment Individual assignments	Textbook PowerPoint Presentation Computer/projector Worksheets Examples of fertilizer nutrients Soil samples/soil probe Examples of nutrient deficiencies Examples of insects Examples of weeds Examples of diseases Herbicide labels Mower

Unit Assessment:	Written test and identification test on weeds, insects, and diseases
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Unit/Course CTSO Activity:	Nursery-Landscape CDE
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**Unit/Course
Culminating
Product:**

Write a report based on a soil test analysis.

Course/Program Credential(s): Credential Certificate Postsecondary Degree University Degree
 Other:

Course Title: Sports Turfgrass Production and Management

Unit: 5	Sports Fields
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Content Standard(s) and Depth of Knowledge Level(s):	<p>Students will:</p> <p>10. Design a sports field, including dimensions and components. Examples: football, baseball, soccer, softball</p> <p>11. Identify characteristics of various parts of a golf course, including greens, fairways, roughs, traps, and tees.</p> <ul style="list-style-type: none"> ○ Describing the basic design and layout features of a golf course ○ Prescribing maintenance procedures for a golf course ○ Identifying responsibilities of the superintendent, director of grounds, golf professional, marshal, and maintenance crew <p>12. Evaluate skills needed to design drainage and irrigation systems.</p> <ul style="list-style-type: none"> ○ Demonstrating skills needed to install and maintain drainage and irrigation systems Examples: plumbing, electrical
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Learning Objective(s) and Depth of Knowledge Level(s):	<p>Students will:</p> <ol style="list-style-type: none"> 1. Measure, design, and draw a football field, soccer field, baseball field, and softball field. 2. Visit a golf course to evaluate the components of the course. 3. Evaluate maintenance procedures for a golf course. 4. Research responsibilities of the superintendent, director of grounds, golf professional, marshal, and maintenance personnel. 5. Design a drainage system for athletic fields. 6. Design an irrigation system for an athletic field. 7. Determine water requirements for turfgrasses.
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Essential Question(s):	
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Content Knowledge	Suggested Instructional Activities Rigor & Relevance Framework (Quadrant)	Suggested Materials, Equipment and Technology Resources
I. Athletic Field layouts and measurements II. Golf course components and layouts III. Sports fields and golf course maintenance procedures IV. Responsibilities of maintenance personnel V. Drainage system components and flow rates	Lecture Demonstration Student practice Guest speaker Group assignment Individual assignments	Textbook PowerPoint Presentation Computer/projector Worksheets

VI. Drainage pipe sizes VII. Irrigation system components VIII. Flow rates, PSI, and GPMs		
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Unit Assessment:	Successfully layout an athletic complex with various types of fields complete with irrigation and drainage systems.
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Unit/Course CTSO Activity:	Nursery-Landscape CDE
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Unit/Course Culminating Product:	Utilizing design(s) of a given athletic field, determine if proper drawing techniques were used and if design can be implemented for a functionable course
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Course/Program Credential(s): <input checked="" type="checkbox"/> Credential <input type="checkbox"/> Certificate <input type="checkbox"/> Postsecondary Degree <input checked="" type="checkbox"/> University Degree <input type="checkbox"/> Other:

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Unit: 6	Turfgrass Tools and Equipment
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Content Standard(s) and Depth of Knowledge Level(s):	<p>Students will:</p> <p>13. Identify uses of tools and equipment needed for the maintenance of turfgrasses.</p> <p>Examples: tools-hand sprayers for applying pesticides, spreaders for applying fertilizers equipment- power mowers for cutting turfgrass, gasoline blowers for removing debris</p>
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Learning Objective(s) and Depth of Knowledge Level(s):	<p>Students will:</p> <ol style="list-style-type: none"> 1. Correctly identify hand and power tools used in the turfgrass industry. 2. Properly operate machines used in the turfgrass industry. 3. Demonstrate how to use hand tools and power tools.
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Essential Question(s):	Is proper tool and machine knowledge a must for a golf course superintendent?
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Content Knowledge	Suggested Instructional Activities Rigor & Relevance Framework (Quadrant)	Suggested Materials, Equipment and Technology Resources
<ol style="list-style-type: none"> I. Hand tool operation II. Power tool operation III. Machine operation 	<p>Lecture Demonstration Student practice Guest speaker Group assignment Individual assignments</p>	<p>Textbook PowerPoint Presentation Computer/projector Worksheets Examples of hand tools Examples of power tools Examples of turfgrass machines</p>

Unit Assessment:	Have students operate hand tools, power tools, and machines to indicate mastery.
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Unit/Course CTSO Activity:	Compact tractor and Safe Tractor Driving CDEs
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Unit/Course Culminating Product:	Use mastery acquired in the safe operation of hand and power tools and machines to a given sports turf area.
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Course/Program Credential(s): Credential Certificate Postsecondary Degree University Degree
 Other:

Course Title: Sports Turfgrass Production and Management

Unit: 7	Business Management
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Content Standard(s) and Depth of Knowledge Level(s):	<p>Students will: Demonstrate business-related work ethics.</p> <p>Examples: following instructions, being on-time, cooperating with others</p> <ul style="list-style-type: none"> ○ Demonstrating managerial skills for the successful operation of a landscape or turfgrass business <p>Examples: keeping records, budgeting, pricing, scheduling work, inventorying purchasing, advertising, handling customer complaints, communicating in oral and written form</p>
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Learning Objective(s) and Depth of Knowledge Level(s):	<p>Students will:</p> <ol style="list-style-type: none"> 1. Create a business plan for a small business. 2. Write a résumé and complete a job application. 3. Create a budget for a lawn or landscape business. 4. Prepare work schedules. 5. Estimate job costs and submit bids.
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Essential Question(s):	Why must turfgrass businesses, especially small businesses prepare budgets?
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Content Knowledge	Suggested Instructional Activities Rigor & Relevance Framework (Quadrant)	Suggested Materials, Equipment and Technology Resources
<ol style="list-style-type: none"> I. Work ethics <ol style="list-style-type: none"> A. Following instructions B. Being on time C. Cooperating with others II. Managerial skills to operate a business <ol style="list-style-type: none"> A. Human resources management B. Recordkeeping C. Budget preparation D. Equipment maintenance records 	<p>Lecture Demonstration Student practice Guest speaker Group assignment Individual assignments</p>	<p>Textbook PowerPoint Presentation Computer/projector Record books Worksheets Budget examples Equipment maintenance record examples</p>

Unit Assessment:	Students will create a landscape or turfgrass related business, write a small business plan, create budgets, schedules, bid work, and hire employees.
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Unit/Course CTSO Activity:	Nursery Landscape CDE
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Unit/Course Culminating Product:	Students will fill out forms related to a landscape business and create and develop business cards and advertisements.
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Course/Program Credential(s): <input checked="" type="checkbox"/> Credential <input type="checkbox"/> Certificate <input type="checkbox"/> Postsecondary Degree <input checked="" type="checkbox"/> University Degree <input type="checkbox"/> Other:

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Unit: 8	Technology
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Content Standard(s) and Depth of Knowledge Level(s):	Students will: 15. Identify advancements in technology that enhance the sports and recreation turfgrass industry.
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Learning Objective(s) and Depth of Knowledge Level(s):	Students will: 1. Research and identify technology that helps the turfgrass business owner.
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Essential Question(s):	Why is knowledge of new technologies important to business owners?
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Content Knowledge	Suggested Instructional Activities Rigor & Relevance Framework (Quadrant)	Suggested Materials, Equipment and Technology Resources
I. Computers/Internet II. GPS III. Variable rate technology IV. New grass varieties/research	Lecture Demonstration Student practice Guest speaker Group assignment Individual assignments	Textbook PowerPoint Presentation Computer/projector Examples of GPS Worksheets Internet Examples of new plant varieties

Unit Assessment:	Research project on technology available to turfgrass business owners.
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Unit/Course CTSO Activity:	Horticultural related CDEs
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Unit/Course Culminating Product:	Research project on technology available to turfgrass business owners.
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Course/Program Credential(s): <input checked="" type="checkbox"/> Credential <input type="checkbox"/> Certificate <input type="checkbox"/> Postsecondary Degree <input checked="" type="checkbox"/> University Degree <input type="checkbox"/> Other:
