2010 Mississippi Curriculum Framework

Postsecondary Horticulture Cluster
(Program CIP: 01.0601 – Horticulture Service Operations and Management)
(Program CIP: 01.0605 – Landscaping)
(Program CIP: 01.0607 – Turf Management)

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 Standards in this document are based on information from the following organizations:

Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses
The proposed standards for Mississippi Postsecondary Horticulture Courses were adapted from certification programs sponsored by the Professional Landcare Network (PLANET) and the Mississippi Nursery and Landscape Association (MNLA). For more information on the PLANET and MNLA certifications, see each association’s respective Web site (http://www.landcarenetwork.org/cms/home.html and www.msnla.org).

Related Academic Standards

21st Century Skills
Reproduced with permission of the Partnership for 21st Century Skills. Further information may be found at www.21stcenturyskills.org
Preface

Postsecondary Horticulture Technology Cluster Research Synopsis

Articles, books, Web sites, and other materials listed at the end of each course were considered during the revision process. These references are suggested for use by instructors and students during the study of the topics outlined.

Industry advisory team members from colleges throughout the state were asked to give input related to changes to be made to the curriculum framework. Specific comments related to soft skills needed in this program include the following:

- Attitude is the very first thing we look for in an individual along with discipline, punctuality, personable, loyalty, and honesty. They should hustle, be decisive, have a good handshake, strong work ethic, honesty, and ambitious.
- A continual positive attitude is most important.
- Adaptability to the surroundings, initiative, punctuality, willingness to new and difficult concepts, responsibility, confidence, communication skills, and flexibility is important.
- An attitude of being a servant is also key. We are a service business, and the client is always right. They must be self-starters and self-reliant; again, a low margin business needs to keep overhead to a minimum. One of the ways to accomplish that is to require less hand-holding needs at the management level and more initiative at the ground level.
- First and foremost personal drive and initiative, a passion for what they want to do and accomplish each day. People skills, ability to work with people of various cultures and attitudes and learn to get along and deal with others in a constructive way. Attitude is key, positive, willingness to work hard, and desire to learn.
- Ability to access risk and make informed decisions is also critical. Strong work ethic, team player, and communication are also necessary. Our managers spend 80% of their time in communicating with employees, customers, and office staff. The ability to build relationships, listen, and then deliver what is promised are skills that will ensure success.

Occupational-specific skills stated include the following:

- Identification of plants, insects, and diseases; calculating insecticides and materials used
- Plant knowledge, equipment experience, and irrigation
- Technical skills, pruning, and drainage
- Knowledge of plant material, pests equipment operation
- Plant identification and construction management
- Plant identification, specifically trees
- Disease and insect diagnosis, GPS/GIS. Equipment operation and maintenance. Proper horticultural maintenance (pruning, chemical application)
- Tree/shrub/plant identification, turf grass identification, pest identification, spray equipment knowledge, and calibration
- Management/supervision skills
- Certainly a working knowledge of mixing formulas of chemicals and a general idea of square foot estimating as it relates to applications
• General mechanic knowledge is also helpful.
• Turfgrass management, welding, landscaping, and construction
• Specific tree and plant knowledge: Know the botanical and common names of the material you work with; know its growth habits, water and soil requirements, fertilizer requirements, and pests that will attack that plant.
• Plant material (life blood)
• Managing crew/production, client communication (written and verbal) and paperwork
• MS Word, Excel, and Outlook as our primary software
• Safety practices emphasized included how to handle chemicals and run equipment. I believe there should be safety instruction all through the program, as we have in our company monthly and intermediate meetings or instruction.
• This would get them ready for periodic safety awareness ongoing in the world of work.
• All OSHA-specific safety and an understanding of an overall safety program. OSHA.
• Use of personal protective equipment (PPE)
• Proper use of chemicals. Review companies’ existing safety manuals, as well as OSHA safety courses.
• Chemical mixing, equipment operation, driving. Chemicals, PPE, really all aspects.

Instructors from colleges throughout the state were also asked to give input on changes to be made to the curriculum framework. Specific comments related to this program included statements from Advisory Committee members, including the following:
• Upgrade the greenhouses and watering systems.
• Look at adding Spanish for the work industry.

Curriculum
The following national standards were referenced in each course of the curriculum:
• CTB/McGraw-Hill LLC Tests of Adult Basic Education, Forms 7 and 8 Academic Standards
• 21st Century Skills
• Industry Standards Name

Industry and instructor comments, along with current research, were considered by the curriculum revision team during the revision process; and changes were made as needed and appropriate. Many of the skills and topics noted in the research were already included in the curriculum framework. Specific changes made at the curriculum revision meeting include the following:

• Competencies and objectives were reviewed to ensure accuracy and appropriateness.
• Survey of Landscape Management course was removed.
• Sustainable practices were added to Green Industry Seminar, Landscape Design I, Landscape Maintenance and Weed Control, Landscape Design II, Landscape Construction and Irrigation, and Lighting Systems.
• Golf Course Equipment Operation and Maintenance added the following:
  o equipment calibrations on liquid and granular spreaders
  o cost/performance analysis
o steps in overseeding cool season grasses
o strengths and weaknesses of cool season grasses

- Golf Course Business Management added common turfgrass calculations.
- The Recommended Tools and Equipment list was updated.

**Assessment**

Students will be assessed using the Postsecondary Horticulture Technology Cluster MS-CPAS2 test.

**Professional Learning**

It is suggested that instructors participate in professional learning related to the following concepts:

- OSHA 10 Instructor Certification
- Green Certification

**Articulation**

Articulation credit from Secondary Horticulture to Postsecondary Horticulture Technology Cluster - Horticulture will be awarded upon implementation of this curriculum by the college. The course to be articulated is Applied Principles of Plant Propagation (HLT 1213) with the stipulation of passing the MS-CPAS2 according to State Board for Community and Junior Colleges (SBCJC) guidelines.

Articulation credit from Secondary Horticulture Technology to Postsecondary Horticulture Technology Cluster - Landscape Management will be awarded upon implementation of this curriculum by the college. The course to be articulated is Leadership Management I (HLT 1411) with the stipulation of passing the MS-CPAS2 according to SBCJC guidelines.

<table>
<thead>
<tr>
<th>Articulated Secondary Course</th>
<th>Articulated Postsecondary Course</th>
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</thead>
<tbody>
<tr>
<td>[S] Horticulture (CIP: 01.0601)</td>
<td>HLT 1411 - Leadership Management</td>
</tr>
</tbody>
</table>

**Statewide Guidelines on Articulated Credit**

**Eligibility**

- To be eligible for articulated credit, a student must do the following:
  - Complete the articulated Secondary Vocational Program
  - Score 80 percent or higher on the Mississippi Career Planning and Assessment System (MS-CPAS2) in the secondary program of study
- To be awarded articulated credit, a student must do the following:
  - Complete application for articulated credit at the community or junior college
  - Enroll in the community or junior college within 18 months of graduation
Successfully complete 12 non-developmental career–technical or academic credit hours in the corresponding articulated postsecondary career–technical program of study.

**How MS-CPAS2 will be documented**
- The Research and Curriculum Unit of Mississippi State University will provide the SBCJC a list of all secondary CTE students scoring at or above the 80 percentile for the articulated programs.
- The SBCJC will forward the list of students eligible for articulated credit to the Colleges.

**Transcripting of articulated credit**
- Students must complete 12 non-developmental career–technical or academic credit hours in the articulated postsecondary career–technical program of study before the articulated credit is transcripted.
- No grade will be given on the transcript for articulated courses; only hours granted will be transcripted (thus resulting in no change in quality points).

**Time limit**
- MS-CPAS2 scores will be accepted to demonstrate competencies for up to 18 months after high school graduation.

**Cost**
- No costs will be assessed on hours earned through articulated credit.
Foreword

As the world economy continues to evolve, businesses and industries must adopt new practices and processes in order to survive. Quality and cost control, work teams and participatory management, and an infusion of technology are transforming the way people work and do business. Employees are now expected to read, write, and communicate effectively; think creatively, solve problems, and make decisions; and interact with each other and the technologies in the workplace. Vocational–technical programs must also adopt these practices in order to provide graduates who can enter and advance in the changing work world.

The curriculum framework in this document reflects these changes in the workplace and a number of other factors that impact local vocational–technical programs. Federal and state legislation calls for articulation between high school and community college programs, integration of academic and vocational skills, and the development of sequential courses of study that provide students with the optimum educational path for achieving successful employment. National skills standards, developed by industry groups and sponsored by the U.S. Department of Education and Labor, provide vocational educators with the expectations of employers across the United States. All of these factors are reflected in the framework found in this document.

Referenced throughout the courses of the curriculum are the 21st Century Skills, which were developed by the Partnership for 21st Century Skills, a group of business and education organizations concerned about the gap between the knowledge and skills learned in school and those needed in communities and the workplace. A portion of the 21st Century Skills addresses learning skills needed in the 21st century, including information and communication skills, thinking and problem-solving skills, and interpersonal and self-directional skills. The need for these types of skills has been recognized for some time, and the 21st Century Skills are adapted in part from the 1991 report from the U.S. Secretary of Labor’s Commission on Achieving Necessary Skills (SCANS). Another important aspect of learning and working in the 21st century involves technology skills, and the International Society for Technology in Education, developers of the National Educational Technology Standards (NETS), were strategic partners in the Partnership for 21st Century Skills.

Each postsecondary program of instruction consists of a program description and a suggested sequence of courses that focus on the development of occupational competencies. Each vocational–technical course in this sequence has been written using a common format, which includes the following components:

- **Course Name** – A common name that will be used by all community and junior colleges in reporting students
- **Course Abbreviation** – A common abbreviation that will be used by all community and junior colleges in reporting students
- **Classification** – Courses may be classified as the following:
  - Vocational–technical core – A required vocational–technical course for all students
Area of concentration (AOC) core – A course required in an area of concentration of a cluster of programs
Vocational–technical elective – An elective vocational–technical course
Related academic course – An academic course that provides academic skills and knowledge directly related to the program area
Academic core – An academic course that is required as part of the requirements for an associate’s degree

- Description – A short narrative that includes the major purpose(s) of the course and the recommended number of hours of lecture and laboratory activities to be conducted each week during a regular semester
- Prerequisites – A listing of any courses that must be taken prior to or on enrollment in the course
- Corequisites – A listing of courses that may be taken while enrolled in the course
- Competencies and Suggested Objectives – A listing of the competencies (major concepts and performances) and of the suggested student objectives that will enable students to demonstrate mastery of these competencies

The following guidelines were used in developing the program(s) in this document and should be considered in compiling and revising course syllabi and daily lesson plans at the local level:

- The content of the courses in this document reflects approximately 75% of the time allocated to each course. The remaining 25% of each course should be developed at the local district level and may reflect the following:
  - Additional competencies and objectives within the course related to topics not found in the state framework, including activities related to specific needs of industries in the community college district
  - Activities that develop a higher level of mastery on the existing competencies and suggested objectives
  - Activities and instruction related to new technologies and concepts that were not prevalent at the time the current framework was developed or revised
  - Activities that implement components of the Mississippi Tech Prep initiative, including integration of academic and vocational–technical skills and coursework, school-to-work transition activities, and articulation of secondary and postsecondary vocational–technical programs
  - Individualized learning activities, including worksite learning activities, to better prepare individuals in the courses for their chosen occupational areas

- Sequencing of the course within a program is left to the discretion of the local district. Naturally, foundation courses related to topics such as safety, tool and equipment usage, and other fundamental skills should be taught first. Other courses related to specific skill areas and related academics, however, may be sequenced to take advantage of seasonal and climatic conditions, resources located outside of the school, and other factors.
- Programs that offer an Associate of Applied Science degree must include a minimum 15-semester-credit-hour academic core. Specific courses to be taken within this core are to be determined by the local district. Minimum academic core courses are as follows:
  - 3 semester credit hours Math/Science Elective
  - 3 semester credit hours Written Communications Elective
  - 3 semester credit hours Oral Communications Elective
  - 3 semester credit hours Humanities/Fine Arts Elective
  - 3 semester credit hours Social/Behavioral Science Elective

It is recommended that courses in the academic core be spaced out over the entire length of the program so that students complete some academic and vocational–technical courses each semester. Each community or junior college has the discretion to select the actual courses that are required to meet this academic core requirement.

- In instances in which secondary programs are directly related to community and junior college programs, competencies and suggested objectives from the high school programs are listed as baseline competencies. These competencies and objectives reflect skills and knowledge that are directly related to the community and junior college vocational–technical program. In adopting the curriculum framework, each community or junior college is asked to give assurances that:
  - Students who can demonstrate mastery of the baseline competencies do not receive duplicate instruction, and
  - Students who cannot demonstrate mastery of this content will be given the opportunity to do so.

- The roles of the baseline competencies are to:
  - Assist community and junior college personnel in developing articulation agreements with high schools, and
  - Ensure that all community and junior college courses provide a higher level of instruction than their secondary counterparts.

- The baseline competencies may be taught as special introduction courses for 3–6 semester hours of institutional credit, which will not count toward associate’s degree requirements. Community and junior colleges may choose to integrate the baseline competencies into ongoing courses in lieu of offering the introduction courses or may offer the competencies through special projects or individualized instruction methods.

- Technical elective courses have been included to allow community colleges and students to customize programs to meet the needs of industries and employers in their area.

In order to provide flexibility within the districts, individual courses within a framework may be customized by:
- Adding new competencies and suggested objectives.
- Revising or extending the suggested objectives for individual competencies.
- Integrating baseline competencies from associated high school programs.
• Adjusting the semester credit hours of a course to be up 1 hour or down 1 hour (after informing the State Board for Community and Junior Colleges [SBCJC] of the change).

In addition, the curriculum framework as a whole may be customized by:
• Resequencing courses within the suggested course sequence.
• Developing and adding a new course that meets specific needs of industries and other clients in the community or junior college district (with SBCJC approval).
• Utilizing the technical elective options in many of the curricula to customize programs.
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Program Description

Horticulture Technology is an instructional program that prepares individuals to produce, process, and market plants, shrubs, and trees used principally for ornamental, recreational, and aesthetic purposes and to establish, maintain, and manage horticultural enterprises such as arboriculture, floriculture, greenhouse operation and management, landscape management, nursery operation and management, and turf management. Included is instruction in machinery and equipment necessary for each horticultural enterprise.

Certificate programs in Horticulture Technology require a minimum of 32 semester hours of credit beyond the baseline competencies with a maximum of 6 semester credit hours taken in the academic core courses. Technical programs in Horticulture require a minimum of 65 semester credit hours.

Articulation

Articulation credit from Secondary Horticulture to Postsecondary Horticulture Technology Cluster will be awarded upon implementation of this curriculum by the college. The course to be articulated is Applied Principles of Plant Propagation (HLT 1213) with the stipulation of passing the MS-CPAS2 according to SBCJC guidelines.

<table>
<thead>
<tr>
<th>Articulated Secondary Course</th>
<th>Articulated Postsecondary Course</th>
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</table>
### Suggested Course Sequence*

**Horticulture Technology**

Baseline Competencies for Horticulture Cluster**

#### FIRST YEAR

<table>
<thead>
<tr>
<th>3 sch</th>
<th>Written Communications Elective</th>
<th>3 sch</th>
<th>Plant Materials II (HLT 1123)</th>
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<tbody>
<tr>
<td>3 sch</td>
<td>Plant Materials I (HLT 1113)</td>
<td>3 sch</td>
<td>Greenhouse and Nursery Production</td>
</tr>
<tr>
<td>3 sch</td>
<td>Approved Elective</td>
<td>3 sch</td>
<td>I (HLT 1313)</td>
</tr>
<tr>
<td>3 sch</td>
<td>Applied Principles of Plant</td>
<td>3 sch</td>
<td>Computer Applications Elective</td>
</tr>
<tr>
<td></td>
<td>Propagation (HLT 1213)</td>
<td>3 sch</td>
<td>Humanities/Fine Arts Elective</td>
</tr>
<tr>
<td>3 sch</td>
<td>Math/Science Elective</td>
<td>3 sch</td>
<td>Approved Elective</td>
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<tr>
<td>3 sch</td>
<td>Approved Elective</td>
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<td>15 sch</td>
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<td>18 sch</td>
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#### SECOND YEAR

<table>
<thead>
<tr>
<th>3 sch</th>
<th>Landscape Design I (HLT 1513)</th>
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<tbody>
<tr>
<td>3 sch</td>
<td>Greenhouse and Nursery Production</td>
</tr>
<tr>
<td>3 sch</td>
<td>II (HLT 2323)</td>
</tr>
<tr>
<td>3 sch</td>
<td>Approved Elective</td>
</tr>
<tr>
<td>3 sch</td>
<td>Social/Behavioral Science Elective</td>
</tr>
<tr>
<td>4 sch</td>
<td>Approved Elective</td>
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<td>16 sch</td>
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<table>
<thead>
<tr>
<th>3 sch</th>
<th>Approved Elective</th>
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<tr>
<td>3 sch</td>
<td>Ornamental and Turf Pest</td>
</tr>
<tr>
<td>3 sch</td>
<td>Management (HLT 2813)***</td>
</tr>
<tr>
<td>4 sch</td>
<td>Landscape Maintenance and Weed</td>
</tr>
<tr>
<td></td>
<td>Control (HLT 2124)</td>
</tr>
<tr>
<td>3 sch</td>
<td>Approved Elective</td>
</tr>
<tr>
<td>3 sch</td>
<td>Oral Communications Elective</td>
</tr>
<tr>
<td></td>
<td>16 sch</td>
</tr>
</tbody>
</table>

* Students who lack entry-level skills in math, English, science, and so forth will be provided related studies.

** Baseline competencies are taken from the high school Agricultural and Environmental Science and Technology program. Students who can document mastery of these competencies should not receive duplicate instruction. Students who cannot demonstrate mastery will be required to do so.

*** Entomology (HLT 2133) AND Plant Pathology (HLT 2143) may be taken in lieu of Ornamental and Turf Pest Management (HLT 2813).
† APPROVED ELECTIVES

Business Mathematics (BAD 1313)
Introduction to Business (BAD 1113)
Business Law (BAD 2413)
Principles of Economics (Macroeconomics) (ECO 2113)
Applied Business Math (BOT 1313)
Business Accounting (BOT 1433)
Computerized Accounting (BOT 2413)
Any instructor-approved computer applications course
Marketing I (MMT 1113)
Advertising (MMT 1323)
Botany (BIO 1314)
Any instructor-approved science course
Plant Science (AGR 1313)
Applied Soils - Conservation and Use (AGT 1714)
Applied Principles of Plant Production (AGT 1313)
Landscape Equipment Operation and Maintenance (HLT 1614)
Floral Design (HLT 2413)
Advanced Floral Design (HLT 2423)
Green Industry Seminar (HLT 1222)
Integrated Production Systems (AQC/HLT 2724)
Water Garden Design (AQC/HLT 2734)
Aquarium and Water Garden Production (AQC/HLT 2744)
Garden Center Management (HLT 2513)
Landscape Construction (HLT 2713)
Landscape Design II (HLT 2523)
Irrigation and Lighting Systems (HLT 2824)
Turfgrass Management (HLT 2113)
Any instructor-approved foreign language
Fundamentals of Drafting (DDT 1114)
Engineering Drawing I (GRA 1112)
Leadership Management (HLT 1411, HLT 1421, HLT 1431, HLT 1441)
Special Problem in Horticulture Cluster [HLT 291(1–3)]
Supervised Work Experience in Horticulture Cluster [HLT 292(1–6)]
Any instructor approved vocational–technical or academic elective

Program Description
Landscape Management Technology

The Landscape Management Technology program is designed to provide students with skills that could lead to employment in the landscape maintenance and landscape construction industries. Specific instruction is offered in the areas of landscape design; selection and care of plants; hard construction including concrete, wood, electrical, irrigation, and lighting; equipment use and maintenance; and business management.

Articulation

Articulation credit from Secondary Horticulture to Postsecondary Horticulture Technology Cluster - Landscape Management will be awarded upon implementation of this curriculum by the college. The course to be articulated is Leadership Management I (HLT 1411) with the stipulation of passing the MS-CPAS2 according to SBCJC guidelines.

<table>
<thead>
<tr>
<th>Articulated Secondary Course</th>
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<tbody>
<tr>
<td>[S] Horticulture (CIP: 01.0601)</td>
<td>HLT 1411 - Leadership Management</td>
</tr>
</tbody>
</table>
## Suggested Course Sequence*
### Landscape Management Technology

#### Baseline Competencies for Horticulture Cluster**

<table>
<thead>
<tr>
<th>FIRST YEAR</th>
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<tbody>
<tr>
<td>3 sch Plant Materials I (HLT 1113)</td>
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<tr>
<td>4 sch Landscape Equipment Operation and Maintenance (HLT 1614)</td>
</tr>
<tr>
<td>6 sch Approved Elective</td>
</tr>
<tr>
<td>3 sch Math/Science Elective</td>
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<tr>
<td><strong>16 sch</strong></td>
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<table>
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<tr>
<th>SECOND YEAR</th>
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<tbody>
<tr>
<td>3 sch Landscape Construction (HLT 2713)</td>
</tr>
<tr>
<td>3 sch Approved Elective</td>
</tr>
<tr>
<td>3 sch Ornamental and Turf Pest Management (HLT 2813)***</td>
</tr>
<tr>
<td>3 sch Turfgrass Management (HLT 2113)</td>
</tr>
<tr>
<td>3 sch Approved Elective</td>
</tr>
<tr>
<td>3 sch Oral Communications Elective</td>
</tr>
<tr>
<td><strong>17 sch</strong></td>
</tr>
</tbody>
</table>

* Students who lack entry-level skills in math, English, science, and so forth will be provided related studies.

** Baseline competencies are taken from the high school Agricultural and Environmental Science and Technology program. Students who can document mastery of these competencies should not receive duplicate instruction. Students who cannot demonstrate mastery will be required to do so.

*** Entomology (HLT 2133) AND Plant Pathology (HLT 2143) may be taken in lieu of Ornamental and Turf Pest Management (HLT 2813).

**APPROVED ELECTIVES**
- Elementary Surveying (DDT 1413)
- Business Accounting (BOT 1433)
- Computerized Accounting (BOT 2413)
- Applied Business Math (BOT 1313)
- Any instructor-approved economics course
- Business Mathematics (BAD 1313)
Any instructor-approved computer applications course
Fundamentals of Drafting (DDT 1114)
Supervised Work Experience in Horticulture Cluster [HLT 292(1–6)]
Freehand Drawing (ART 1313)
Survey of Landscape Management (HLT 1451)
Floral Design (HLT 2413)
Advanced Floral Design (HLT 2423)
Green Industry Seminar (HLT 1222)
Garden Center Management (HLT 2513)
Landscape Design II (HLT 2523)
Integrated Production Systems (AQC/HLT 2724)
Water Garden Design (AQC/HLT 2734)
Aquarium and Water Garden Production (AQC/HLT 2744)
Any instructor-approved foreign language
Botany (BIO 1314)
Any instructor-approved science
Applied Soils - Conservation and Use (AGT 1714)
Basic Soils (AGR 2314)
Advertising (MMT 1323)
Business Law (BAD 2413)
Professional Development (BOT 1213)
Leadership Management (HLT 1411, HLT 1421, HLT 1431, HLT 1441)
Special Problem in Horticulture Cluster [HLT 291(1–3)]
Any instructor-approved vocational–technical or academic elective

Program Description
Golf/Recreational Turf Management Technology

The Golf/Recreational Turf Management Technology program is designed to prepare individuals to establish, maintain, and manage turf areas for golf/recreational and other purposes. The curriculum includes instruction in business management, design, turfgrass management, irrigation, and operation/maintenance of equipment and machinery.

Articulation

At this time there is no content in the Secondary Horticulture Technology that will articulate with the Golf/Recreational Turf Management Technology.
Suggested Course Sequence*
Golf/Recreational Turf Management Technology

Baseline Competencies for Horticulture Cluster**

FIRST YEAR

<table>
<thead>
<tr>
<th>Sch</th>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Written Communications Elective</td>
</tr>
<tr>
<td>3</td>
<td>Computer Elective</td>
</tr>
<tr>
<td>3</td>
<td>Plant Materials I (HLT 1113)</td>
</tr>
<tr>
<td>3</td>
<td>Approved Elective</td>
</tr>
<tr>
<td>3</td>
<td>Social/Behavioral Science Elective</td>
</tr>
<tr>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

SECOND YEAR

<table>
<thead>
<tr>
<th>Sch</th>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Landscape Design I (HLT 1513)</td>
</tr>
<tr>
<td>4</td>
<td>Golf Course Equipment Operation and Maintenance (GTT 1614)</td>
</tr>
<tr>
<td>3</td>
<td>Landscape Construction (HLT 2713)</td>
</tr>
<tr>
<td>3</td>
<td>Turfgrass Management for Golf Courses (GTT 2813)</td>
</tr>
<tr>
<td>3</td>
<td>Approved Elective</td>
</tr>
<tr>
<td>3</td>
<td>Humanities/Fine Arts Elective</td>
</tr>
<tr>
<td>19</td>
<td></td>
</tr>
</tbody>
</table>

* Students who lack entry-level skills in math, English, science, and so forth will be provided related studies.

** Baseline competencies are taken from the high school Agricultural and Environmental Science and Technology program. Students who can document mastery of these competencies should not receive duplicate instruction. Students who cannot demonstrate mastery will be required to do so.

*** Entomology (HLT 2133) AND Plant Pathology (HLT 2143) may be taken in lieu of Ornamental and Turf Pest Management (HLT 2813).

Approved Electives

Business Communication (BOT 2813)
Business Accounting (BOT 1433)
Principles of Accounting I (ACC 1213)
Principles of Accounting II (ACC 1223)
Electronic Spreadsheet (BOT 1813)
Any instructor-approved computer applications course
Fundamentals of Drafting (DDT 1114)
Garden Center Management (HLT 2513)
Applied Principles of Plant Production (AGT 1313)
Plant Science (AGR 1313)
Green Industry Seminar (HLT 1222)
Integrated Production Systems (AQC/HLT 2724)
Water Garden Design (AQC/HLT 2734)
Any instructor-approved foreign language
Botany (BIO 1314)
General Biology I (BIO 1134)
General Biology II (BIO 1144)
Any instructor-approved science
Applied Soils - Conservation and Use (AGT 1714)
Basic Soils (AGR 2314)
Advertising (MMT 1323)
Business Law (BAD 2413)
Leadership Management (HLT 1411, HLT 1421, HLT 1431, HLT 1441)
Special Problem in Horticulture Cluster [HLT 291(1–3)]
Supervised Work Experience in Horticulture Cluster [HLT 292(1–6)]
Any instructor-approved vocational–technical or academic elective

Horticulture/Landscape Management Courses

Course Name: Plant Materials I

Course Abbreviation: HLT 1113

Classification: Vocational–Technical Core

Description: A survey of common ornamental plants used in landscaping including deciduous and evergreen trees, shrubs, vines, ground covers, and annuals and perennials, this course includes instruction in basic classification and identification procedures and in identifying characteristics, maintenance, and use of the plants in a horticulture setting. This course is designed to be offered in the fall semester. (3 sch: 1-hr lecture, 4-hr lab)

Prerequisite: None

Competencies and Suggested Objectives

<table>
<thead>
<tr>
<th>1. Demonstrate an understanding of identifying and classifying plant materials.</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Classify plants using the Latin system from kingdom to variety and cultivar (if applicable).</td>
</tr>
<tr>
<td>b. Implement the rules for writing proper botanical names of plants including punctuation, capitalization, and spelling.</td>
</tr>
<tr>
<td>c. Identify growth characteristics and leaf shapes of indigenous plants.</td>
</tr>
<tr>
<td>d. Describe the different environmental requirements of plants including the concepts of microclimates and zone hardiness requirements.</td>
</tr>
<tr>
<td>e. Describe the different types of ornamental uses of plants.</td>
</tr>
<tr>
<td>f. Identify a minimum of 100 plants including deciduous and evergreen trees, shrubs, vines, ground covers, and annuals and perennials by botanical name and common name.</td>
</tr>
<tr>
<td>g. Describe characteristics, maintenance, propagation, and use of plant materials.</td>
</tr>
<tr>
<td>h. Identify common insects and diseases associated with all plant materials.</td>
</tr>
</tbody>
</table>

STANDARDS

Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses

The following standards were adapted from the publication *Occupational Analysis: Certification Standards for Landscape Professional*, as published by the Professional Landcare Network (PLANET) and the Canadian Nursery Landscape Association, and from testing materials for Certified Landscape Technician—Exterior and Certified Landscape Technician—Interior, as published by PLANET. For more information on the PLANET certifications, go to the Association Web site at [http://www.landcarenetwork.org](http://www.landcarenetwork.org).
Certified Landscape Technician - Interior
Block 10    Plant Identification

Certified Landscape Technician - Exterior
Block 18    Softscape Installation

**Mississippi Certified Nurseryman’s Certificate**
The standards below were adopted from the training materials for the Mississippi Certified Nursery Professional Certificate sponsored by the Mississippi Nursery and Landscape Association (MNLA). For more information on this certification, go to the MNLA Web site at [www.msnla.org](http://www.msnla.org).

**Mississippi Nursery and Landscape Association**
Block 25    Landscaping
Block 26    Turf
Block 27    Small Fruits and Nuts
Block 28    Interior Plant Care
Block 29    Poisonous Plants

**Related Academic Standards**

| R1       | Interpret Graphic Information (forms, maps, reference sources) |
| R2       | Words in Context (same and opposite meaning)                  |
| R3       | Recall Information (details, sequence)                        |
| R4       | Construct Meaning (main idea, summary–paraphrase, compare–contrast, cause–effect) |
| R5       | Evaluate and Extend Meaning (fact–opinion, predict outcomes, point of view) |
| M1       | Addition of Whole Numbers (no regrouping, regrouping)         |
| M2       | Subtraction of Whole Numbers (no regrouping, regrouping)      |
| M3       | Multiplication of Whole Numbers (no regrouping, regrouping)   |
| M4       | Division of Whole Numbers (no remainder, remainder)            |
| M5       | Decimals (addition, subtraction, multiplication, division)      |
| M6       | Fractions (addition, subtraction, multiplication, division)     |
| M7       | Integers (addition, subtraction, multiplication, division)      |
| M8       | Percents                                                       |
| M9       | Algebraic Operations                                           |
| A1       | Numeration (ordering, place value, scientific notation)        |
| A2       | Number Theory (ratio, proportion)                             |
| A3       | Data Interpretation (graph, table, chart, diagram)             |
| A4       | Pre-Algebra and Algebra (equations, inequality)                |
| A5       | Measurement (money, time, temperature, length, area, volume)   |
| A6       | Geometry (angles, Pythagorean theory)                          |
| A7       | Computation in Context (whole numbers, decimals, fractions, algebraic operations) |
| A8       | Estimation (rounding, estimation)                              |
| L1       | Usage (pronoun, tense, subject–verb agreement, adjective, adverb) |
| L2       | Sentence Formation (fragments, run-on, clarity)                |
| L3       | Paragraph Development (topic sentence, supporting sentence, sequence) |
SUGGESTED REFERENCES


Course Name: Plant Materials II

Course Abbreviation: HLT 1123

Classification: Vocational–Technical Core

Description: A continuation of Plant Materials I with emphasis on foliage and interior and flowering plants, this course is designed to be taught in the spring semester. (3 sch: 1-hr lecture, 4-hr lab)

Prerequisite: Plant Materials I (HLT 1113)

Competencies and Suggested Objectives

1. Demonstrate an understanding of identifying and classifying plant materials. Block 10, Block 18, Block 28, Block 29
   a. Classify plants using the Latin system from kingdom to variety and cultivar (if applicable).
   b. Implement the rules for writing proper botanical names of plants including punctuation, capitalization, and spelling.
   c. Describe growth characteristics and leaf shapes of indigenous plants.
   d. Describe the different environmental requirements of plants including the concepts of microclimates and zone hardness requirements.
   e. Describe the different types of ornamental uses of plants.
   f. Identify a minimum of 100 plants including deciduous and evergreen trees, shrubs, vines, ground cover, interior plants, annuals, and perennials by botanical name and common name.
   g. Describe characteristics, maintenance, propagation, and use of plant materials.
   h. Identify common insects and diseases associated with all plant materials.

STANDARDS

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Certified Landscape Technician - Interior
Block 10    Plant Identification

Certified Landscape Technician - Exterior
Block 18    Softscape Installation
Mississippi Certified Nurseryman’s Certificate
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Mississippi Nursery and Landscape Association
Block 25  Landscaping
Block 28  Interior Plant Care
Block 29  Poisonous Plants

**Related Academic Standards**

| R1 | Interpret Graphic Information (forms, maps, reference sources) |
| R2 | Words in Context (same and opposite meaning) |
| R3 | Recall Information (details, sequence) |
| R4 | Construct Meaning (main idea, summary–paraphrase, compare–contrast, cause–effect) |
| R5 | Evaluate and Extend Meaning (fact–opinion, predict outcomes, point of view) |
| M1 | Addition of Whole Numbers (no regrouping, regrouping) |
| M2 | Subtraction of Whole Numbers (no regrouping, regrouping) |
| M3 | Multiplication of Whole Numbers (no regrouping, regrouping) |
| M4 | Division of Whole Numbers (no remainder, remainder) |
| M5 | Decimals (addition, subtraction, multiplication, division) |
| M6 | Fractions (addition, subtraction, multiplication, division) |
| M7 | Integers (addition, subtraction, multiplication, division) |
| M8 | Percents |
| M9 | Algebraic Operations |
| A1 | Numeration (ordering, place value, scientific notation) |
| A2 | Number Theory (ratio, proportion) |
| A3 | Data Interpretation (graph, table, chart, diagram) |
| A4 | Pre-Algebra and Algebra (equations, inequality) |
| A5 | Measurement (money, time, temperature, length, area, volume) |
| A6 | Geometry (angles, Pythagorean theory) |
| A7 | Computation in Context (whole numbers, decimals, fractions, algebraic operations) |
| A8 | Estimation (rounding, estimation) |
| L1 | Usage (pronoun, tense, subject–verb agreement, adjective, adverb) |
| L2 | Sentence Formation (fragments, run-on, clarity) |
| L3 | Paragraph Development (topic sentence, supporting sentence, sequence) |
| L4 | Capitalization (proper noun, titles) |
| L5 | Punctuation (comma, semicolon) |
| L6 | Writing Conventions (quotation marks, apostrophe, parts of a letter) |
| S1 | Vowel (short, long) |
| S2 | Consonant (variant spelling, silent letter) |
| S3 | Structural Unit (root, suffix) |

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21st Century Skills

<table>
<thead>
<tr>
<th>CS1</th>
<th>Global Awareness</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS2</td>
<td>Financial, Economic, and Business Literacy</td>
</tr>
<tr>
<td>CS3</td>
<td>Civic Literacy</td>
</tr>
<tr>
<td>CS4</td>
<td>Information and Communication Skills</td>
</tr>
<tr>
<td>CS5</td>
<td>Thinking and Problem-Solving Skills</td>
</tr>
<tr>
<td>CS6</td>
<td>Interpersonal and Self-Directional Skills</td>
</tr>
</tbody>
</table>

**SUGGESTED REFERENCES**


Course Name: Applied Principles of Plant Propagation

Course Abbreviation: HLT 1213

Classification: AOC Core (Horticulture Technology)

Description: This course develops expertise and knowledge of plant propagation methods including seeding, separation, division, grafting, and layering. This course also includes an introduction to tissue culture methods. (3 sch: 1-hr lecture, 4-hr lab)

Prerequisite: None

Competencies and Suggested Objectives

<table>
<thead>
<tr>
<th>Competency</th>
<th>Suggested Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Describe the advantages and disadvantages of vegetative and sexual propagation, and list examples of each.</td>
</tr>
<tr>
<td>2.</td>
<td>Demonstrate techniques used in planting and collecting seed.</td>
</tr>
<tr>
<td></td>
<td>a. State requirements and components of a seeding medium.</td>
</tr>
<tr>
<td></td>
<td>b. Describe requirements for successful propagation by seed (timing, planting depth, media preparation, etc.).</td>
</tr>
<tr>
<td></td>
<td>c. Identify and describe scarification and stratification treatments for seeds containing immature embryos, dormant embryos, and/or hard seed coats.</td>
</tr>
<tr>
<td></td>
<td>d. Propagate plants from purchased seed and from collected seed.</td>
</tr>
<tr>
<td></td>
<td>e. Describe symptoms of damping off. Identify chemical and cultural control methods.</td>
</tr>
<tr>
<td></td>
<td>f. Describe proper timing of transplanting seedlings and procedures used in hardening off.</td>
</tr>
<tr>
<td>3.</td>
<td>Describe the environmental factors for optimum propagation of cuttings.</td>
</tr>
<tr>
<td></td>
<td>a. State requirements and components of a cutting propagation medium.</td>
</tr>
<tr>
<td></td>
<td>b. Describe the uses of rooting hormones, and state the advantages/disadvantages of liquid as opposed to talc.</td>
</tr>
<tr>
<td></td>
<td>c. Describe how the physical appearance of softwood, semi-hardwood, and hardwood cuttings vary.</td>
</tr>
<tr>
<td></td>
<td>d. Propagate at least five of the following types of cuttings: softwood, semi-hardwood, hardwood, root, leaf, tip, mallet, and cane cuttings.</td>
</tr>
<tr>
<td>4.</td>
<td>Describe components used to make a mist bench for commercial propagation of cuttings, and discuss their functions.</td>
</tr>
<tr>
<td>5.</td>
<td>Demonstrate concepts involved in other vegetative propagation techniques.</td>
</tr>
<tr>
<td></td>
<td>a. Describe the procedures used in layering plants including simple, air, trench, mound, tip, and serpentine layering.</td>
</tr>
<tr>
<td></td>
<td>b. Propagate a plant by one of the layering methods listed.</td>
</tr>
<tr>
<td></td>
<td>c. Describe specialized roots and stems (including tubers, corms, rhizomes, stolens, and bulbs) used in separation and division.</td>
</tr>
<tr>
<td></td>
<td>d. Propagate plants by separation and division.</td>
</tr>
<tr>
<td></td>
<td>e. Itemize the benefits of grafting and budding.</td>
</tr>
<tr>
<td></td>
<td>f. Describe the factors to consider in collecting and storing scion and bud wood.</td>
</tr>
<tr>
<td></td>
<td>g. Identify the cambium layer of a stem, and describe its role and importance in grafting.</td>
</tr>
<tr>
<td></td>
<td>h. Describe the advantages and disadvantages of propagation by tissue culture.</td>
</tr>
</tbody>
</table>
STANDARDS

Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses

Mississippi Certified Nurseryman’s Certificate
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Mississippi Nursery and Landscape Association
Block 23 Cultural Practices
Block 25 Landscaping

Related Academic Standards

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary–paraphrase, compare–contrast, cause–effect)
R5 Evaluate and Extend Meaning (fact–opinion, predict outcomes, point of view)
M1 Addition of Whole Numbers (no regrouping, regrouping)
M2 Subtraction of Whole Numbers (no regrouping, regrouping)
M3 Multiplication of Whole Numbers (no regrouping, regrouping)
M4 Division of Whole Numbers (no remainder, remainder)
M5 Decimals (addition, subtraction, multiplication, division)
M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents
M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)
A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
S1 Vowel (short, long)
S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

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21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES


Course Name: Green Industry Seminar

Course Abbreviation: HLT 1222

Classification: Vocational–Technical Elective (Horticulture Technology, Landscape Management Technology, Golf/Recreational Turf Management Technology)

Description: This course is designed to provide an overview of current Green Industry events and job opportunities in the industry and specific landscape and horticulture related topics. (2 sch: 2-hr lecture) (Previously listed as HLT 1222 Horticulture Principles)

Prerequisite: None

Competencies and Suggested Objectives

<table>
<thead>
<tr>
<th>Competency</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Demonstrate the ability to solve mathematical exercises related to the landscape/horticulture industry.</td>
</tr>
<tr>
<td></td>
<td>a. Identify geometric measurements, and complete practice exercises relating to perimeter, area, and volume.</td>
</tr>
<tr>
<td></td>
<td>b. Calculate sales discounts and markup pricing procedures.</td>
</tr>
<tr>
<td></td>
<td>c. Calculate area, quantity, and sizes for planting, and area, quantity, and volume of fertilizers and chemicals.</td>
</tr>
<tr>
<td>2.</td>
<td>Prepare and complete the necessary processes and forms for job placement.</td>
</tr>
<tr>
<td></td>
<td>a. Prepare a cover letter, resume, job application form, and follow-up letter.</td>
</tr>
<tr>
<td></td>
<td>b. Discuss job search and resume posting to include online sources and placement office listings.</td>
</tr>
<tr>
<td></td>
<td>c. Review interview techniques, and complete job interview.</td>
</tr>
<tr>
<td>3.</td>
<td>Describe and discuss current events in the green industry.</td>
</tr>
<tr>
<td></td>
<td>a. Identify and discuss national, state, and local regulations and laws relating to the green industry.</td>
</tr>
<tr>
<td></td>
<td>b. Identify and review current green industry periodicals and publications.</td>
</tr>
<tr>
<td></td>
<td>c. Identify industry professional and trade associations.</td>
</tr>
<tr>
<td>4.</td>
<td>Identify career opportunities in the green industry.</td>
</tr>
<tr>
<td></td>
<td>a. Examine various career choices in the industry through guest speakers and/or field trips.</td>
</tr>
<tr>
<td>5.</td>
<td>Describe and explore sustainable practices in the green industry.</td>
</tr>
</tbody>
</table>

STANDARDS

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published by PLANET. For more information on the PLANET certifications, go to the Association Web site at http://www.landcarenetwork.org.

Certified Landscape Professional
Block 1 Corporate Financial Management
Block 4 Human Resources
Block 5 Leadership and Corporate Citizenship
Block 6 Marketing and Sales Management
Block 8 Strategic Planning

Certified Landscape Technician - Exterior
Block 18 Softscape Installation
Block 19 Hardscape Installation
Block 20 Turf Maintenance
Block 21 Ornamental Maintenance
Block 22 Irrigation

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Mississippi Nursery and Landscape Association
Block 24 Pest Control
Block 25 Landscaping
Block 26 Turf
Block 27 Small Fruits and Nuts
Block 28 Interior Plant Care
Block 29 Poisonous Plants
Block 30 Displaying and Marketing

**Related Academic Standards**

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary–paraphrase, compare–contrast, cause–effect)
R5 Evaluate and Extend Meaning (fact–opinion, predict outcomes, point of view)
M1 Addition of Whole Numbers (no regrouping, regrouping)
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A5  Measurement (money, time, temperature, length, area, volume)
A6  Geometry (angles, Pythagorean theory)
A7  Computation in Context (whole numbers, decimals, fractions, algebraic operations)
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21st Century Skills

CS1  Global Awareness
CS2  Financial, Economic, and Business Literacy
CS3  Civic Literacy
CS4  Information and Communication Skills
CS5  Thinking and Problem-Solving Skills
CS6  Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES


Journals


Garden center merchandizing and management [Magazine]. Fort Worth, TX: Branch Smith.

Course Name: Greenhouse and Nursery Production I

Course Abbreviation: HLT 1313

Classification: AOC Core (Horticulture Technology)

Description: This course develops skills and expertise in the selection, equipping, and management of a greenhouse facility. Emphasis is placed on different media, supplies, and chemicals used in greenhouses and on the scheduling and production of greenhouse crops. (3 sch: 1-hr lecture, 4-hr lab)

Prerequisite: None

<table>
<thead>
<tr>
<th>Competencies and Suggested Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Contrast the types of structures, locations, and equipment used in the greenhouse industry. Block 23</td>
</tr>
<tr>
<td>a. Identify the different types of greenhouse and nursery structures and structure coverings, and state the advantages and disadvantages of each.</td>
</tr>
<tr>
<td>b. Describe factors to consider in locating and sizing greenhouse and nursery facilities.</td>
</tr>
<tr>
<td>c. Describe the equipment used to control the different environmental factors that affect greenhouse production.</td>
</tr>
<tr>
<td>2. Explain the process of acclimation of plant materials. Block 23</td>
</tr>
<tr>
<td>a. Discuss the concept of acclimation as applied to plant production and the different methods that are used to acclimate plants.</td>
</tr>
<tr>
<td>b. Identify harmful and useful gases found in greenhouses, and describe their control.</td>
</tr>
<tr>
<td>3. Produce a plan to illustrate proper watering, lighting, and timing techniques. Block 23</td>
</tr>
<tr>
<td>a. Describe the importance of proper watering and chemigation techniques on greenhouse nursery production in terms of frequency, amount, method of application, and economic considerations.</td>
</tr>
<tr>
<td>b. Develop and implement a watering and lighting schedule for a given greenhouse or nursery crop.</td>
</tr>
<tr>
<td>4. Determine principles of media selection. Block 23</td>
</tr>
<tr>
<td>a. Describe the characteristics of organic and inorganic components used in soilless media.</td>
</tr>
<tr>
<td>b. Contrast the advantages and disadvantages of soil and soilless media.</td>
</tr>
<tr>
<td>c. Adjust the pH of a growing medium to meet the requirements of a specific crop.</td>
</tr>
<tr>
<td>5. Formulate a seeding schedule. Block 23</td>
</tr>
<tr>
<td>a. Compare and contrast the advantages and disadvantages of the different methods for starting plants in a greenhouse or nursery including seeds, plugs, liners, and rooted cuttings.</td>
</tr>
<tr>
<td>b. Identify available sources for seeds, plants, media, containers, and other supplies necessary for a greenhouse and nursery operation.</td>
</tr>
<tr>
<td>6. Prepare and complete production schedule for a spring crop. Block 23</td>
</tr>
<tr>
<td>a. Develop a crop program for spring production of greenhouse plants to include the selection of plant species to be grown, timing of operations, supplies, marketing, production costs, and spacing for optimum production.</td>
</tr>
</tbody>
</table>
b. Contrast the differences in greenhouse and nursery crop programming.

7. Examine seasonal re-plantings of nursery and greenhouse plant materials. Block 23
   a. Describe and perform the practice of repotting plants in both greenhouse and nursery operations.

8. Create appropriate merchandising strategies for crop production. Block 30
   a. Develop a marketing plan for a greenhouse or nursery crop to include program evaluation, review techniques, PERT or other charts, scheduling difficulties, costing and pricing of plants, advertising, storing and holding, and shipping.

STANDARDS

Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses

Mississippi Certified Nurseryman’s Certificate
The standards below were adopted from the training materials for the Mississippi Certified Nursery Professional Certificate sponsored by the Mississippi Nursery and Landscape Association (MNLA). For more information on this certification, go to the MNLA Web site at www.msnla.org.

Mississippi Nursery and Landscape Association
Block 23 Cultural Practices
Block 30 Displaying and Marketing

Related Academic Standards

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary–paraphrase, compare–contrast, cause–effect)
R5 Evaluate and Extend Meaning (fact–opinion, predict outcomes, point of view)
M1 Addition of Whole Numbers (no regrouping, regrouping)
M2 Subtraction of Whole Numbers (no regrouping, regrouping)
M3 Multiplication of Whole Numbers (no regrouping, regrouping)
M4 Division of Whole Numbers (no remainder, remainder)
M5 Decimals (addition, subtraction, multiplication, division)
M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents
M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)
A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
S1 Vowel (short, long)
S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

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21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES


Videos

Holm, J., & Regan, R. (n.d.). *Container grown plants* [Videotape]. (Available from CEV Multimedia, P.O. Box 65265, Lubbock, TX 79464, Phone 1.800.922.9965

Holm, J., & Regan, R. (n.d.). *Field grown plants* [Videotape]. (Available from CEV Multimedia, P.O. Box 65265, Lubbock, TX 79464, Phone 1.800.922.9965, Fax 1.800.6398)

Holm, J., & Regan, R. (n.d.). *Greenhouse and nursery safety: Safety program* [Videotape]. (Available from CEV Multimedia, P.O. Box 65265, Lubbock, TX 79464, Phone 1.800.922.9965, Fax 1.800.6398)
Course Name: Leadership Management

Course Abbreviation: HLT 1411, HLT 1421, HLT 1431, HLT 1441

Classification: Vocational–Technical Elective (Horticulture Technology, Landscape Management Technology, Golf/Recreational Turf Management Technology)

Description: This course develops an awareness of interpersonal skills essential for job success. Topics include self-image, team building, leadership skills, time and stress management, and human resources management. (1 sch: 2-hr lab)

Prerequisite: None

<table>
<thead>
<tr>
<th>Competencies and Suggested Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Formulate personal educational and professional goals, and develop a plan to accomplish those goals. Block 6, Block 8</td>
</tr>
<tr>
<td>2. Find, plan, and implement a minimum of one community service project. Block 5, Block 8</td>
</tr>
</tbody>
</table>

STANDARDS

Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses

The following standards were adapted from the publication *Occupational Analysis: Certification Standards for Landscape Professional*, as published by the Professional Landcare Network (PLANET) and the Canadian Nursery Landscape Association, and from testing materials for Certified Landscape Technician—Exterior and Certified Landscape Technician—Interior, as published by PLANET. For more information on the PLANET certifications, go to the Association Web site at [http://www.landcarenetwork.org](http://www.landcarenetwork.org).

Certified Landscape Professional
Block 5 Leadership and Corporate Citizenship
Block 6 Marketing and Sales Management
Block 8 Strategic Planning

Related Academic Standards

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary–paraphrase, compare–contrast, cause–effect)
R5 Evaluate and Extend Meaning (fact–opinion, predict outcomes, point of view)
M1 Addition of Whole Numbers (no regrouping, regrouping)
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M3 Multiplication of Whole Numbers (no regrouping, regrouping)
M4 Division of Whole Numbers (no remainder, remainder)
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M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents
M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)
A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
S1 Vowel (short, long)
S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

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21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES


Web Site

Course Name: Landscape Design I

Course Abbreviation: HLT 1513

Classification: Vocational–Technical Core

Description: An introduction to the concepts, principles, and elements of landscape design, this course includes instruction and practice in the use of drawing instruments and supplies and in conducting a site analysis. (3 sch: 1-hr lecture, 4-hr lab)

Prerequisite: None

<table>
<thead>
<tr>
<th>Competencies and Suggested Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Demonstrate the use of drawing instruments and supplies used in the preparation of landscape plans. Block 18, Block 19</td>
</tr>
<tr>
<td>a. Complete various drawings using basic drawing instruments and supplies.</td>
</tr>
<tr>
<td>b. Define and apply drawing terms related to plant materials and structures used in the landscape.</td>
</tr>
<tr>
<td>c. Draw standard landscape symbols to scale, and use consistent freehand lettering techniques to label drawings.</td>
</tr>
<tr>
<td>2. Describe and utilize site inventory and analysis processes and elements and principles of design. Block 18, Block 19, Block 25</td>
</tr>
<tr>
<td>a. Conduct a site inventory and analysis.</td>
</tr>
<tr>
<td>b. Appraise client needs, preferences, and interests.</td>
</tr>
<tr>
<td>c. Create a basic landscape design plan using basic presentation methods and media and the elements and principles of design.</td>
</tr>
<tr>
<td>3. Describe and explore sustainable practices in the green industry. Block 18, Block 26, Block 27, Block 28, Block 29, Block 30</td>
</tr>
</tbody>
</table>

STANDARDS

Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses

The following standards were adapted from the publication *Occupational Analysis: Certification Standards for Landscape Professional*, as published by the Professional Landcare Network (PLANET) and the Canadian Nursery Landscape Association, and from testing materials for Certified Landscape Technician—Exterior and Certified Landscape Technician—Interior as published by PLANET. For more information on the PLANET certifications, go to the Association Web site at [http://www.landcarenetwork.org](http://www.landcarenetwork.org).

Certified Landscape Technician - Exterior
Block 18 Softscape Installation
Block 19 Hardscape Installation
Block 20 Turf Maintenance
Block 21 Ornamental Maintenance
Block 22 Irrigation

Mississippi Certified Nurseryman’s Certificate
The standards below were adopted from the training materials for the Mississippi Certified Nursery Professional Certificate sponsored by the Mississippi Nursery and Landscape Association (MNLA). For more information on this certification, go to the MNLA Web site at www.msnla.org.

Mississippi Nursery and Landscape Association
Block 25 Landscaping
Block 26 Turf
Block 27 Small Fruits and Nuts
Block 28 Interior Plant Care
Block 29 Poisonous Plants
Block 30 Displaying and Marketing

Related Academic Standards

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary–paraphrase, compare–contrast, cause–effect)
R5 Evaluate and Extend Meaning (fact–opinion, predict outcomes, point of view)
M1 Addition of Whole Numbers (no regrouping, regrouping)
M2 Subtraction of Whole Numbers (no regrouping, regrouping)
M3 Multiplication of Whole Numbers (no regrouping, regrouping)
M4 Division of Whole Numbers (no remainder, remainder)
M5 Decimals (addition, subtraction, multiplication, division)
M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents
M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)
A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
S1  Vowel (short, long)
S2  Consonant (variant spelling, silent letter)
S3  Structural Unit (root, suffix)

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21st Century Skills

CS1  Global Awareness
CS2  Financial, Economic, and Business Literacy
CS3  Civic Literacy
CS4  Information and Communication Skills
CS5  Thinking and Problem-Solving Skills
CS6  Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES


Postsecondary Horticulture Cluster

Course Name: Landscape Equipment Operation and Maintenance

Course Abbreviation: HLT 1614

Classification: AOC Core (Landscape Management Technology), Vocational–Technical Elective (Horticulture Technology)

Description: This course aims to provide instruction and practice in the safe and proper operation and maintenance of landscape and turf equipment. (4 sch: 2-hr lecture, 4-hr lab)

Prerequisite: None

Competencies and Suggested Objectives

1. Demonstrate proper maintenance, handling, and storage of landscape and turf equipment and supplies. Block 9, Block 11, Block 18, Block 19, Block 20, Block 24
   a. Identify power equipment used in landscaping, and describe their function or use.
   b. Describe storage procedures for power tools and supplies.
   c. Use an operator’s manual to determine maintenance and storage procedures, fuel and lubricant specifications, and operating procedures for a specific piece of equipment.
   d. Perform owner–operator maintenance on a diesel tractor to include checking fluid levels, changing oil and filters, servicing air filter, bleeding fuel system, and so forth.

2. Describe basic first aid and safety precautions for using landscape maintenance equipment. Block 7, Block 11, Block 18, Block 19, Block 20, Block 21, Block 22
   a. Describe basic first aid procedures for treating shock, heat stroke, cuts, burns, poisoning, and so forth.
   b. Describe safety precautions to be followed in working with landscape and turf equipment and supplies.

3. Demonstrate safe and proper operation of landscape and turf equipment and supplies. Block 11, Block 18, Block 19, Block 20, Block 21, Block 22
   a. Demonstrate the ability to properly and safely operate the following equipment: mowers, string trimmer, edger, chain saw, hedge trimmer, blowers, backpack sprayer, tiller, spreader, tractors, box blade, front-end loader, spray rigs, and so forth.
   b. Demonstrate the ability to properly and safely use landscape and turf supplies.
   c. Load, secure, and transport equipment and supplies safely.

4. Demonstrate maintenance of two- and four-stroke gasoline engines. Block 11, Block 18, Block 19, Block 20, Block 21, Block 22
   a. Differentiate between two-stroke and four-stroke gasoline engines.
   b. Perform owner–operator maintenance on a two-stroke engine to include mixing oil and fuel, servicing air filters, replacing spark plugs, and so forth.
   c. Perform owner–operator maintenance on a four-stroke engine to include checking and changing oil, servicing air filters, replacing spark plugs, and so forth.

5. Explain a working knowledge of small engine nomenclature, function, and purpose. Block 11, Block 18, Block 19, Block 20, Block 21, Block 22
   a. Demonstrate the ability to perform repairs on equipment in the field and troubleshooting as needed.
STANDARDS

Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses

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Certified Landscape Professional
Block 7 Risk, Law, and Contracts

Certified Landscape Technician - Interior
Block 9 Pesticides

Certified Landscape Technician - Exterior
Block 18 Softscape Installation
Block 19 Hardscape Installation
Block 20 Turf Maintenance
Block 21 Ornamental Maintenance
Block 22 Irrigation

Mississippi Certified Nurseryman’s Certificate
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Mississippi Nursery and Landscape Association
Block 24 Pest Control

Related Academic Standards

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary–paraphrase, compare–contrast, cause–effect)
R5 Evaluate and Extend Meaning (fact–opinion, predict outcomes, point of view)
M1 Addition of Whole Numbers (no regrouping, regrouping)
M2 Subtraction of Whole Numbers (no regrouping, regrouping)
M3 Multiplication of Whole Numbers (no regrouping, regrouping)
M4 Division of Whole Numbers (no remainder, remainder)
M5 Decimals (addition, subtraction, multiplication, division)
M6  Fractions (addition, subtraction, multiplication, division)
M7  Integers (addition, subtraction, multiplication, division)
M8  Percents
M9  Algebraic Operations
A1  Numeration (ordering, place value, scientific notation)
A2  Number Theory (ratio, proportion)
A3  Data Interpretation (graph, table, chart, diagram)
A4  Pre-Algebra and Algebra (equations, inequality)
A5  Measurement (money, time, temperature, length, area, volume)
A6  Geometry (angles, Pythagorean theory)
A7  Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8  Estimation (rounding, estimation)
L1  Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2  Sentence Formation (fragments, run-on, clarity)
L3  Paragraph Development (topic sentence, supporting sentence, sequence)
L4  Capitalization (proper noun, titles)
L5  Punctuation (comma, semicolon)
L6  Writing Conventions (quotation marks, apostrophe, parts of a letter)
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21st Century Skills

CS1  Global Awareness
CS2  Financial, Economic, and Business Literacy
CS3  Civic Literacy
CS4  Information and Communication Skills
CS5  Thinking and Problem-Solving Skills
CS6  Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES


Course Name: Turfgrass Management

Course Abbreviation: HLT 2113

Classification: AOC Core (Landscape Management Technology), Vocational–Technical Elective (Horticulture Technology)

Description: A course to provide instruction and practice in the identification, selection, installation, and management/maintenance of turfgrass. (3 sch: 2-hr lecture, 2-hr lab)

Prerequisite: None

### Competencies and Suggested Objectives

<table>
<thead>
<tr>
<th>Competency</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Discuss the role of turfgrass and its importance in the green industry.</td>
</tr>
<tr>
<td></td>
<td>a. Discuss the role of turfgrass in landscape management.</td>
</tr>
<tr>
<td></td>
<td>b. Describe the role of the turfgrass manager.</td>
</tr>
<tr>
<td></td>
<td>c. Identify the different types of turfgrasses, and discuss their classification, growth habits, advantages, and disadvantages.</td>
</tr>
<tr>
<td></td>
<td>d. Identify different types of mowing equipment, and describe the uses and limitations of each type.</td>
</tr>
<tr>
<td></td>
<td>e. Describe the role of sod farming and seed harvesting in the green industry.</td>
</tr>
<tr>
<td>2.</td>
<td>Describe the steps to establish turfgrass.</td>
</tr>
<tr>
<td></td>
<td>a. Associate soil types and soil modification techniques with management of different turfgrasses.</td>
</tr>
<tr>
<td></td>
<td>b. Discuss the advantages and disadvantages of the different methods of turfgrass establishments.</td>
</tr>
<tr>
<td></td>
<td>c. Establish turfgrasses by seeding, plugging, sprigging, and sodding.</td>
</tr>
<tr>
<td></td>
<td>d. Calculate the proper amount and apply fertilizer and other amendments to meet soil test requirements for fertility and pH adjustment.</td>
</tr>
<tr>
<td>3.</td>
<td>Describe the maintenance procedures to manage a healthy turf.</td>
</tr>
<tr>
<td></td>
<td>a. Plan fertilization programs and application schedules for different turfgrasses.</td>
</tr>
<tr>
<td></td>
<td>b. Discuss factors to consider in planning a mowing program for different turfgrasses including frequency of mowing and mower height.</td>
</tr>
<tr>
<td></td>
<td>c. Discuss irrigation needs of turf and signs that indicate when irrigation is needed.</td>
</tr>
<tr>
<td></td>
<td>d. Describe cultural procedures of turfgrass management including dethatching and aeration.</td>
</tr>
<tr>
<td>4.</td>
<td>Discuss golf course design and management.</td>
</tr>
<tr>
<td></td>
<td>a. Discuss the basic design and layout procedures of a golf course.</td>
</tr>
<tr>
<td></td>
<td>b. Discuss maintenance practices for greens, tees, fairways, traps, and roughs.</td>
</tr>
</tbody>
</table>

### STANDARDS

Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses

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Certified Landscape Technician - Exterior
Block 20 Turf Maintenance

Mississippi Certified Nurseryman’s Certificate
The standards below were adopted from the training materials for the Mississippi Certified Nursery Professional Certificate sponsored by the Mississippi Nursery and Landscape Association (MNLA). For more information on this certification, go to the MNLA Web site at www.mslna.org.

Mississippi Nursery and Landscape Association
Block 26 Turf

Related Academic Standards

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary–paraphrase, compare–contrast, cause–effect)
R5 Evaluate and Extend Meaning (fact–opinion, predict outcomes, point of view)
M1 Addition of Whole Numbers (no regrouping, regrouping)
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A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
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L5 Punctuation (comma, semicolon)
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21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES


Course Name: Landscape Maintenance and Weed Control

Course Abbreviation: HLT 2124

Classification: Vocational–Technical Core

Description: This course aims to provide instruction and practice in the maintenance of trees, shrubs, and other greenscape features. This course includes instruction in the use of herbicides and other weed control measures. (4 sch: 2-hr lecture, 4-hr lab)

Prerequisite: None

Competencies and Suggested Objectives

<table>
<thead>
<tr>
<th>Competency</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Describe the scope of landscape maintenance. Block 2, Block 9, Block 13, Block 15, Block 16, Block 20, Block 21, Block 23, Block 24, Block 26, Block 27, Block 28, Block 29</td>
</tr>
<tr>
<td></td>
<td>a. Describe job opportunities in landscape maintenance and related areas of work.</td>
</tr>
<tr>
<td></td>
<td>b. Discuss job search and resume posting to include online sources and placement office listings.</td>
</tr>
<tr>
<td>2.</td>
<td>Identify and perform the proper method and timing of pruning operations for specific trees and shrubs. Block 2, Block 3, Block 13, Block 21</td>
</tr>
<tr>
<td></td>
<td>a. Describe storage procedures for hand tools.</td>
</tr>
<tr>
<td></td>
<td>b. Perform routine hand tool maintenance to include oiling, cleaning, and sharpening.</td>
</tr>
<tr>
<td></td>
<td>c. Prune a shrub by thinning.</td>
</tr>
<tr>
<td></td>
<td>d. Prune a shrub by heading back.</td>
</tr>
<tr>
<td></td>
<td>e. Prune a tree to a central leader.</td>
</tr>
<tr>
<td></td>
<td>f. Prune a tree as a multi-stem.</td>
</tr>
<tr>
<td></td>
<td>g. Prune a tree to repair storm damage.</td>
</tr>
<tr>
<td></td>
<td>h. Provide wound care for trees.</td>
</tr>
<tr>
<td>3.</td>
<td>Explain the laws and regulations governing licensure. Block 7, Block 9, Block 24, Block 25</td>
</tr>
<tr>
<td></td>
<td>a. Describe the laws and regulations of licensure of tree surgeons.</td>
</tr>
<tr>
<td></td>
<td>b. Describe the laws and regulations of licensure of commercial ornamental and turf weed control applicators.</td>
</tr>
<tr>
<td>4.</td>
<td>Describe the different types of weeds and herbicides. Block 9, Block 10, Block 18, Block 20, Block 21, Block 23, Block 24, Block 26</td>
</tr>
<tr>
<td></td>
<td>a. Identify weeds, and describe their life cycle and developmental stages.</td>
</tr>
<tr>
<td></td>
<td>b. Describe the characteristics of the different types of herbicides.</td>
</tr>
<tr>
<td></td>
<td>c. Describe the practices utilized for weed control.</td>
</tr>
<tr>
<td>5.</td>
<td>Develop a 1-year maintenance schedule for residential and commercial applications. Block 9, Block 10, Block 11, Block 20, Block 21, Block 23, Block 24, Block 26</td>
</tr>
<tr>
<td></td>
<td>a. Plan a maintenance schedule to include routine shrub and tree care, lawn care, fertilization, fixture maintenance, winter care, and plantings including winter grasses, replanting and re-mulching of shrubs, and scheduling of seasonal color.</td>
</tr>
<tr>
<td>6.</td>
<td>Demonstrate proper procedures for applying chemicals to turfgrasses. Block 2, Block 9, Block 10, Block 11, Block 14, Block 15, Block 16, Block 18, Block 20, Block 21, Block 23, Block 24, Block 26, Block 29</td>
</tr>
<tr>
<td></td>
<td>a. Explain an appropriate method for calibrating a backpack sprayer and a boom sprayer.</td>
</tr>
</tbody>
</table>
|  | b. Demonstrate an appropriate method for calibrating rotary and drop spreading
Writing Team Draft

Postsecondary Horticulture Cluster

<table>
<thead>
<tr>
<th>equipment for application of granular chemicals.</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Describe and explore sustainable practices in the green industry. Block 18, Block 26, Block 27, Block 28, Block 29, Block 30</td>
</tr>
</tbody>
</table>

**STANDARDS**

*Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses*

The following standards were adapted from the publication *Occupational Analysis: Certification Standards for Landscape Professional*, as published by the Professional Landcare Network (PLANET) and the Canadian Nursery Landscape Association, and from testing materials for Certified Landscape Technician—Exterior and Certified Landscape Technician—Interior, as published by PLANET. For more information on the PLANET certifications, go to the Association Web site at [http://www.landcarenetwork.org](http://www.landcarenetwork.org).

Certified Landscape Professional
Block 2 Exterior Production/Operations and Horticulture
Block 3 Interior Production/Operations and Horticulture
Block 7 Risk, Law, and Contracts

Certified Landscape Technician - Interior
Block 9 Pesticides
Block 10 Plant Identification
Block 11 Safety
Block 13 Pruning
Block 14 Fertilization/Nutrition
Block 15 Insects
Block 16 Disease

Certified Landscape Technician - Exterior
Block 18 Softscape Installation
Block 20 Turf Maintenance
Block 21 Ornamental Maintenance

**Mississippi Certified Nurseryman’s Certificate**
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Mississippi Nursery and Landscape Association
Block 23 Cultural Practices
Block 24 Pest Control
Block 25 Landscaping
Block 26 Turf

**Postsecondary Horticulture Cluster**
Block 27  Small Fruits and Nuts
Block 28  Interior Plant Care
Block 29  Poisonous Plants
Block 30  Displaying and Marketing

Related Academic Standards

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary–paraphrase, compare–contrast, cause–effect)
R5 Evaluate and Extend Meaning (fact–opinion, predict outcomes, point of view)
M1 Addition of Whole Numbers (no regrouping, regrouping)
M2 Subtraction of Whole Numbers (no regrouping, regrouping)
M3 Multiplication of Whole Numbers (no regrouping, regrouping)
M4 Division of Whole Numbers (no remainder, remainder)
M5 Decimals (addition, subtraction, multiplication, division)
M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents
M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)
A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
S1 Vowel (short, long)
S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

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21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy

Postsecondary Horticulture Cluster
CS4   Information and Communication Skills  
CS5   Thinking and Problem-Solving Skills  
CS6   Interpersonal and Self-Directional Skills

**SUGGESTED REFERENCES**


Web Site

Course Name: Entomology

Course Abbreviation: HLT 2133

Classification: Vocational–Technical Elective

Description: This course provides instruction and practice in the identification and control of ornamental turf pests. This course includes instruction in pest identification, pesticide use and safety, and legal aspects of pest control. Entomology (HLT 2133) AND Plant Pathology (HLT 2143) may be taken in lieu of Ornamental and Turf Pest Management (HLT 2813). (3 sch: 2-hr lecture, 2-hr lab)

Prerequisite: None

Competencies and Suggested Objectives

<table>
<thead>
<tr>
<th>1.</th>
<th>Describe and explain the different types of insects associated with landscape and horticulture plant material. Block 2, Block 9, Block 10, Block 11, Block 15, Block 18, Block 20, Block 21, Block 23, Block 24, Block 27</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Identify a minimum of 16 orders of insect phylum, and describe the characteristics common to each.</td>
</tr>
<tr>
<td>b.</td>
<td>Describe the different life cycles of insects.</td>
</tr>
<tr>
<td>c.</td>
<td>Identify and describe the damage caused by insects, and state the control methods.</td>
</tr>
<tr>
<td>d.</td>
<td>Collect a minimum of 10 orders and 25 insects.</td>
</tr>
<tr>
<td>2.</td>
<td>Describe and apply control methods for insect management. Block 2, Block 9, Block 10, Block 11, Block 15, Block 18, Block 20, Block 21, Block 23, Block 24, Block 27</td>
</tr>
<tr>
<td>a.</td>
<td>Identify the different pesticide formulations, and describe the application procedures.</td>
</tr>
<tr>
<td>b.</td>
<td>Describe pesticide safety to include toxicity and health, storage, material safety data sheets, application procedures, first aid, and the effects on the environment.</td>
</tr>
<tr>
<td>c.</td>
<td>Interpret information found on pesticide labels.</td>
</tr>
<tr>
<td>d.</td>
<td>Discuss integrated pest management (IPM).</td>
</tr>
<tr>
<td>e.</td>
<td>Identify laws and regulations governing pesticide applicators.</td>
</tr>
<tr>
<td>f.</td>
<td>Apply for and take private/commercial pesticide applicator’s certification exam and ornamental and turf pesticide applicator’s exam (Category 3).</td>
</tr>
</tbody>
</table>

STANDARDS

Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses

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Certified Landscape Professional

Postsecondary Horticulture Cluster
Block 2    Exterior Production/Operations and Horticulture

Certified Landscape Technician - Interior
Block 9    Pesticides
Block 10   Plant Identification
Block 11   Safety
Block 15   Insects

Certified Landscape Technician - Exterior
Block 18   Softscape Installation
Block 20   Turf Maintenance
Block 21   Ornamental Maintenance

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Mississippi Nursery and Landscape Association
Block 23   Cultural Practices
Block 24   Pest Control
Block 27   Small Fruits and Nuts

Related Academic Standards

R1    Interpret Graphic Information (forms, maps, reference sources)
R2    Words in Context (same and opposite meaning)
R3    Recall Information (details, sequence)
R4    Construct Meaning (main idea, summary—paraphrase, compare—contrast, cause—effect)
R5    Evaluate and Extend Meaning (fact—opinion, predict outcomes, point of view)
M1    Addition of Whole Numbers (no regrouping, regrouping)
M2    Subtraction of Whole Numbers (no regrouping, regrouping)
M3    Multiplication of Whole Numbers (no regrouping, regrouping)
M4    Division of Whole Numbers (no remainder, remainder)
M5    Decimals (addition, subtraction, multiplication, division)
M6    Fractions (addition, subtraction, multiplication, division)
M7    Integers (addition, subtraction, multiplication, division)
M8    Percents
M9    Algebraic Operations
A1    Numeration (ordering, place value, scientific notation)
A2    Number Theory (ratio, proportion)
A3    Data Interpretation (graph, table, chart, diagram)
A4    Pre-Algebra and Algebra (equations, inequality)
A5    Measurement (money, time, temperature, length, area, volume)
A6  Geometry (angles, Pythagorean theory)
A7  Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8  Estimation (rounding, estimation)
L1  Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2  Sentence Formation (fragments, run-on, clarity)
L3  Paragraph Development (topic sentence, supporting sentence, sequence)
L4  Capitalization (proper noun, titles)
L5  Punctuation (comma, semicolon)
L6  Writing Conventions (quotation marks, apostrophe, parts of a letter)
S1  Vowel (short, long)
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21st Century Skills

CS1  Global Awareness
CS2  Financial, Economic, and Business Literacy
CS3  Civic Literacy
CS4  Information and Communication Skills
CS5  Thinking and Problem-Solving Skills
CS6  Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES


Pest management principle—Ornamental and turf pest control, category 3. Mississippi State: Mississippi State University Extension Service.
Course Name: Plant Pathology

Course Abbreviation: HLT 2143

Classification: Vocational–Technical Elective

Description: Provides instruction and practice in the identification and control of ornamental and turf diseases. This course includes instruction in pest identification, pesticide use and safety, and legal aspects of pest control. Entomology (HLT 2133) AND Plant Pathology (HLT 2143) may be taken in lieu of Ornamental and Turf Pest Management (HLT 2813). (3 sch: 2-hr lecture, 2-hr lab)

Prerequisite: None

<table>
<thead>
<tr>
<th>Competencies and Suggested Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Describe and explain the different types of disease common to ornamental and turf plants.</td>
</tr>
<tr>
<td>a. Identify a minimum of 10 bacteria and fungi diseases. Block 2, Block 9, Block 10, Block 11, Block 16, Block 18, Block 20, Block 21, Block 23, Block 24, Block 26, Block 27</td>
</tr>
<tr>
<td>b. Describe the different life cycles of diseases.</td>
</tr>
<tr>
<td>c. Identify and describe the damage caused by diseases, and state the control methods.</td>
</tr>
<tr>
<td>d. Collect a minimum of 10 diseases common to ornamental and turf plants.</td>
</tr>
<tr>
<td>2. Describe control methods for disease control and management. Block 2, Block 9, Block 10, Block 11, Block 16, Block 18, Block 20, Block 21, Block 23, Block 24, Block 26, Block 27</td>
</tr>
<tr>
<td>a. Identify the different pesticide formulations, and describe the application procedures.</td>
</tr>
<tr>
<td>b. Describe pesticide safety to include toxicity and health, storage, material safety data sheets, application procedures, first aid, and the effects on the environment.</td>
</tr>
<tr>
<td>c. Interpret information found on pesticide labels.</td>
</tr>
<tr>
<td>d. Discuss integrated pest management (IPM).</td>
</tr>
<tr>
<td>e. Identify laws and regulations governing pesticide applicators.</td>
</tr>
<tr>
<td>f. Apply for and take private/commercial pesticide applicator’s certification exam and ornamental and turf pesticide applicator’s exam (Category 3).</td>
</tr>
</tbody>
</table>

STANDARDS

Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses

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Certified Landscape Professional
Block 2 Exterior Production/Operations and Horticulture

Postsecondary Horticulture Cluster
Certified Landscape Technician - Interior
Block 9  Pesticides
Block 10  Plant Identification
Block 11  Safety
Block 12  Watering/Sub-irrigation
Block 16  Disease

Certified Landscape Technician - Exterior
Block 18  Softscape Installation
Block 20  Turf Maintenance
Block 21  Ornamental Maintenance

Mississippi Certified Nurseryman’s Certificate
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Mississippi Nursery and Landscape Association
Block 23  Cultural Practices
Block 24  Pest Control
Block 26  Turf
Block 27  Small Fruits and Nuts

Related Academic Standards

R1  Interpret Graphic Information (forms, maps, reference sources)
R2  Words in Context (same and opposite meaning)
R3  Recall Information (details, sequence)
R4  Construct Meaning (main idea, summary–paraphrase, compare–contrast, cause–effect)
R5  Evaluate and Extend Meaning (fact–opinion, predict outcomes, point of view)
M1  Addition of Whole Numbers (no regrouping, regrouping)
M2  Subtraction of Whole Numbers (no regrouping, regrouping)
M3  Multiplication of Whole Numbers (no regrouping, regrouping)
M4  Division of Whole Numbers (no remainder, remainder)
M5  Decimals (addition, subtraction, multiplication, division)
M6  Fractions (addition, subtraction, multiplication, division)
M7  Integers (addition, subtraction, multiplication, division)
M8  Percents
M9  Algebraic Operations
A1  Numeration (ordering, place value, scientific notation)
A2  Number Theory (ratio, proportion)
A3  Data Interpretation (graph, table, chart, diagram)
A4  Pre-Algebra and Algebra (equations, inequality)
A5  Measurement (money, time, temperature, length, area, volume)
A6  Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
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S3 Structural Unit (root, suffix)

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21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES


**Course Name:** Landscape Business Management

**Course Abbreviation:** HLT 2313

**Classification:** AOC Core (Landscape Management Technology)

**Description:** This course aims to provide instruction and practice regarding the management of a landscape operation. This course includes instruction in estimating and bidding; personnel management, supervision, and development; and business practices. (3 sch: 3-hr lecture)

**Prerequisite:** None

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### Competencies and Suggested Objectives

1. Discuss entrepreneurship opportunities in the green industry.
   - Block 1, Block 2, Block 3, Block 4, Block 5, Block 6, Block 7, Block 8
   
   a. Describe factors to consider in making a decision to open a business.
   b. State sources and procedures for funding a small business.
   c. Describe the advantages and disadvantages of the different forms of business ownership.

2. Demonstrate proper record-keeping procedures associated with business ownership.
   - Block 1, Block 2, Block 3, Block 6, Block 7
   
   a. Describe the uses of records in managing a landscape business.
   b. Maintain records for a small landscaping business including income and expense statements, cash flow, inventory, and a net worth statement.

3. Describe procedures and techniques for hiring and retaining employees.
   - Block 4, Block 5, Block 7
   
   a. Discuss methods for training employees.
   b. Describe factors related to employer–employee relationships including insurance, wages and benefits, withholding taxes, performance evaluation, employer liability, and terminations.
   c. Examine laws and regulatory agencies relating to hiring migratory and immigrant labor.

4. Describe and utilize the steps in developing and submitting a bid.
   - Block 1, Block 2, Block 3, Block 7, Block 8
   
   a. Interpret specifications and working drawings.
   b. Complete sample forms required for submitting estimates and bids.
   c. Write a bid for a specific job that includes direct and indirect costs.
   d. Write a contract for a specific job that includes the following essential elements: working drawings and specifications, general and specific conditions, and methods of payment.
   e. Develop a work schedule for a landscape business.

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**STANDARDS**

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**Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses**

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**Postsecondary Horticulture Cluster**
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**Certified Landscape Professional**
Block 1  Corporate Financial Management
Block 2  Exterior Production/Operations and Horticulture
Block 3  Interior Production/Operations and Horticulture
Block 4  Human Resources
Block 5  Leadership and Corporate Citizenship
Block 6  Marketing and Sales Management
Block 7  Risk, Law, and Contracts
Block 8  Strategic Planning

**Related Academic Standards**

R1  Interpret Graphic Information (forms, maps, reference sources)
R2  Words in Context (same and opposite meaning)
R3  Recall Information (details, sequence)
R4  Construct Meaning (main idea, summary–paraphrase, compare–contrast, cause–effect)
R5  Evaluate and Extend Meaning (fact–opinion, predict outcomes, point of view)
M1  Addition of Whole Numbers (no regrouping, regrouping)
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M3  Multiplication of Whole Numbers (no regrouping, regrouping)
M4  Division of Whole Numbers (no remainder, remainder)
M5  Decimals (addition, subtraction, multiplication, division)
M6  Fractions (addition, subtraction, multiplication, division)
M7  Integers (addition, subtraction, multiplication, division)
M8  Percents
M9  Algebraic Operations
A1  Numeration (ordering, place value, scientific notation)
A2  Number Theory (ratio, proportion)
A3  Data Interpretation (graph, table, chart, diagram)
A4  Pre-Algebra and Algebra (equations, inequality)
A5  Measurement (money, time, temperature, length, area, volume)
A6  Geometry (angles, Pythagorean theory)
A7  Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8  Estimation (rounding, estimation)
L1  Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2  Sentence Formation (fragments, run-on, clarity)
L3  Paragraph Development (topic sentence, supporting sentence, sequence)
L4  Capitalization (proper noun, titles)
L5  Punctuation (comma, semicolon)
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21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES


Course Name: Greenhouse and Nursery Production II

Course Abbreviation: HLT 2323

Classification: AOC Core (Horticulture Technology)

Description: This course is a continuation of Greenhouse and Nursery Production I with emphasis on production practices associated with fertilization, pest control, environment control, and marketing. (3 sch: 1-hr lecture, 4-hr lab)

Prerequisite: Greenhouse and Nursery Production I (HLT 1313)

<table>
<thead>
<tr>
<th>Competencies and Suggested Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Prepare a complete production schedule for a fall crop.</td>
</tr>
<tr>
<td>a. Develop a crop program for fall production of greenhouse plants to include selection of plant species to be grown, timing of operations, supplies, marketing, production costs, and spacing for optimum production.</td>
</tr>
<tr>
<td>2. Examine fertilization principles.</td>
</tr>
<tr>
<td>a. Identify and describe the use of fertilizer proportioners in greenhouse and nursery production.</td>
</tr>
<tr>
<td>b. Describe factors that influence fertilizer application rates and methods on different plants.</td>
</tr>
<tr>
<td>c. Contrast the advantages and disadvantages of different fertilizer formulations.</td>
</tr>
<tr>
<td>d. Calculate the amount of chemicals and water needed to produce a solution that contains the recommended parts-per-million mixture of active ingredients for a specific crop.</td>
</tr>
<tr>
<td>e. Apply different fertilizer formulations.</td>
</tr>
<tr>
<td>3. Calculate and use growth regulators.</td>
</tr>
<tr>
<td>a. Describe the use of and apply growth regulators on specific greenhouse and nursery crops.</td>
</tr>
<tr>
<td>4. Identify and develop pest and pest management procedures.</td>
</tr>
<tr>
<td>a. Identify major greenhouse pests including insects, viruses, bacteria, fungi, and weeds, and describe their life cycle and control.</td>
</tr>
<tr>
<td>b. Develop and implement an integrated pest management system for greenhouse or nursery operation.</td>
</tr>
<tr>
<td>5. Recognize lighting concepts for crop production.</td>
</tr>
<tr>
<td>a. Describe methods for maximizing and minimizing light intensity for greenhouse crops.</td>
</tr>
<tr>
<td>b. Describe the concept of photoperiod manipulation, and apply it to the production of greenhouse crops.</td>
</tr>
<tr>
<td>6. Evaluate nursery production techniques and methods.</td>
</tr>
<tr>
<td>a. Describe, contrast, and apply nursery production techniques for bare root, container, and field grown stock.</td>
</tr>
<tr>
<td>b. Use the American Standards for Nursery Stock to grade nursery plants.</td>
</tr>
</tbody>
</table>

STANDARDS

Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses

Postsecondary Horticulture Cluster
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**Certified Landscape Professional**
- Block 2  Exterior Production/Operations and Horticulture
- Block 3  Interior Production/Operations and Horticulture
- Block 6  Marketing and Sales Management

**Certified Landscape Technician - Interior**
- Block 9  Pesticides
- Block 14  Fertilization/Nutrition

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**Mississippi Nursery and Landscape Association**
- Block 23  Cultural Practices
- Block 24  Pest Control
- Block 28  Interior Plant Care

**Related Academic Standards**

- **R1** Interpret Graphic Information (forms, maps, reference sources)
- **R2** Words in Context (same and opposite meaning)
- **R3** Recall Information (details, sequence)
- **R4** Construct Meaning (main idea, summary–paraphrase, compare–contrast, cause–effect)
- **R5** Evaluate and Extend Meaning (fact–opinion, predict outcomes, point of view)
- **M1** Addition of Whole Numbers (no regrouping, regrouping)
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- **M5** Decimals (addition, subtraction, multiplication, division)
- **M6** Fractions (addition, subtraction, multiplication, division)
- **M7** Integers (addition, subtraction, multiplication, division)
- **M8** Percents
- **M9** Algebraic Operations
- **A1** Numeration (ordering, place value, scientific notation)
- **A2** Number Theory (ratio, proportion)
- **A3** Data Interpretation (graph, table, chart, diagram)
A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
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21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES


Videos

Holm, J., & Regan, R. (n.d.). Container grown plants [Videotape]. (Available from CEV Multimedia, P.O. Box 65265, Lubbock, TX 79464, Phone 1.800.922.9965

Holm, J., & Regan, R. (n.d.). Field grown plants [Videotape]. (Available from CEV Multimedia, P.O. Box 65265, Lubbock, TX 79464, Phone 1.800.922.9965, Fax 1.800.6398)
Holm, J., & Regan, R. (n.d.). *Greenhouse and nursery safety: Safety program* [Videotape]. (Available from CEV Multimedia, P.O. Box 65265, Lubbock, TX 79464, Phone 1.800.922.9965, Fax 1.800.6398)

Course Name: Floral Design

Course Abbreviation: HLT 2413

Classification: Vocational–Technical Elective (Horticulture Technology)

Description: A course to develop knowledge and skills associated with retail floristry, this course includes instruction in preparing arrangements with fresh and dried materials, seasonal pieces, funeral sprays, and the use of floral wire services. (3 sch: 1-hr lecture, 4-hr lab)

Prerequisite: None

Competencies and Suggested Objectives

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Explain the uses of different pieces of equipment and supplies used in floral design.</td>
</tr>
<tr>
<td></td>
<td>a. Describe the uses of different pieces of equipment used in floral design.</td>
</tr>
<tr>
<td></td>
<td>b. Describe the uses of supplies used in floral design.</td>
</tr>
<tr>
<td>2.</td>
<td>Explain the use of cut flowers and other plant materials used in floral design.</td>
</tr>
<tr>
<td></td>
<td>a. Describe the use of cut flowers and other plant materials used in floral design.</td>
</tr>
<tr>
<td>3.</td>
<td>Examine floral preservation techniques.</td>
</tr>
<tr>
<td></td>
<td>a. Describe and apply factors to consider in conditioning and storing flowers and plant materials.</td>
</tr>
<tr>
<td>4.</td>
<td>Create floral designs in commercially applicable styles.</td>
</tr>
<tr>
<td></td>
<td>a. Prepare a circular arrangement with fresh flowers.</td>
</tr>
<tr>
<td></td>
<td>b. Prepare a horizontal arrangement with fresh flowers.</td>
</tr>
<tr>
<td></td>
<td>c. Prepare a triangular arrangement with fresh flowers.</td>
</tr>
<tr>
<td></td>
<td>d. Prepare an angle design with fresh flowers.</td>
</tr>
<tr>
<td></td>
<td>e. Prepare specialty designs including corsages, boutonnieres, and wedding bouquets.</td>
</tr>
<tr>
<td></td>
<td>f. Prepare a standing wreath for a funeral.</td>
</tr>
<tr>
<td></td>
<td>g. Prepare a basket arrangement for a funeral.</td>
</tr>
<tr>
<td></td>
<td>h. Prepare a bud vase.</td>
</tr>
<tr>
<td></td>
<td>i. Prepare a Christmas arrangement.</td>
</tr>
<tr>
<td></td>
<td>j. Prepare a seasonal dried arrangement.</td>
</tr>
<tr>
<td>5.</td>
<td>Illustrate a knowledge of practical delivery.</td>
</tr>
<tr>
<td></td>
<td>a. Organize a delivery schedule for floral orders.</td>
</tr>
<tr>
<td></td>
<td>b. Demonstrate procedures for delivering floral times.</td>
</tr>
<tr>
<td>6.</td>
<td>Explain floral wire capabilities.</td>
</tr>
</tbody>
</table>

STANDARDS

Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses

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Certified Landscape Professional
Block 1 Corporate Financial Management
Block 3 Interior Production/Operations and Horticulture
Block 6 Marketing and Sales Management

Mississippi Certified Nurseryman’s Certificate
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Mississippi Nursery and Landscape Association
Block 28 Interior Plant Care

Related Academic Standards

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary–paraphrase, compare–contrast, cause–effect)
R5 Evaluate and Extend Meaning (fact–opinion, predict outcomes, point of view)
M1 Addition of Whole Numbers (no regrouping, regrouping)
M2 Subtraction of Whole Numbers (no regrouping, regrouping)
M3 Multiplication of Whole Numbers (no regrouping, regrouping)
M4 Division of Whole Numbers (no remainder, remainder)
M5 Decimals (addition, subtraction, multiplication, division)
M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents
M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)
A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
SUGGESTED REFERENCES


Videos

*Floral design from concepts to beauty 1 and 2* [Videotape]. (n.d.). (Available from HLS&R Video Productions, P.O. Box 20070, Houston, TX 77225)

*Floral design from concepts to beauty 3 and 4* [Videotape]. (n.d.). (Available from HLS&R Video Productions, P.O. Box 20070, Houston, TX 77225)


*Importing and marketing fresh cut flowers* [Videotape]. (n.d.). (Available from Flower Trading Inc., 1950 N.W. 89th Place, Miami, FL 33172, Phone 1.305.592.3746, Fax 1.305.594.7567)

Web Site

Course Name: Advanced Floral Design

Course Abbreviation: HLT 2423

Classification: Vocational–Technical Elective (Horticulture Technology)

Description: A course designed to continue to build on techniques from Floral Design, this course will include instruction on developing business skills needed every day and specialty design skills needed every day and specialty designs used in the floral industry.

Prerequisite: None

<table>
<thead>
<tr>
<th>Competencies and Suggested Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Explain the uses of different pieces of equipment and supplies used in floral design.</td>
</tr>
<tr>
<td>a. Describe the uses of different pieces of equipment used in floral design.</td>
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<tr>
<td>b. Describe the uses of supplies used in floral design.</td>
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<tr>
<td>2. Explain the use of cut flowers and other plant materials used in floral design.</td>
</tr>
<tr>
<td>a. Describe the use of cut flowers and other plant materials used in floral design.</td>
</tr>
<tr>
<td>3. Examine floral preservation techniques.</td>
</tr>
<tr>
<td>a. Describe and apply factors to consider in conditioning and storing flowers and plant materials.</td>
</tr>
<tr>
<td>4. Create floral designs in commercially applicable styles.</td>
</tr>
<tr>
<td>a. Prepare seasonal arrangements.</td>
</tr>
<tr>
<td>b. Prepare balloon creations.</td>
</tr>
<tr>
<td>c. Prepare and demonstrate the care of tropical designs.</td>
</tr>
<tr>
<td>d. Prepare sympathy pieces including casket pieces, basket, pots, and standing sprays.</td>
</tr>
<tr>
<td>e. Prepare European designs.</td>
</tr>
<tr>
<td>f. Prepare and design window and floor designs.</td>
</tr>
<tr>
<td>g. Prepare and plan wedding decorations and designs.</td>
</tr>
<tr>
<td>h. Prepare everyday arrangements.</td>
</tr>
<tr>
<td>i. Plan and prepare party decorations.</td>
</tr>
<tr>
<td>5. Demonstrate knowledge of business organization.</td>
</tr>
<tr>
<td>a. Explain seasonal business needs and organization.</td>
</tr>
<tr>
<td>b. Explain everyday business needs and organization.</td>
</tr>
<tr>
<td>6. Demonstrate knowledge of basic accounting practices of a floral business.</td>
</tr>
</tbody>
</table>

STANDARDS

Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses

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Block 3 Interior Production/Operations and Horticulture
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Mississippi Nursery and Landscape Association
Block 28 Interior Plant Care

### Related Academic Standards

- R1 Interpret Graphic Information (forms, maps, reference sources)
- R2 Words in Context (same and opposite meaning)
- R3 Recall Information (details, sequence)
- R4 Construct Meaning (main idea, summary–paraphrase, compare–contrast, cause–effect)
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- M4 Division of Whole Numbers (no remainder, remainder)
- M5 Decimals (addition, subtraction, multiplication, division)
- M6 Fractions (addition, subtraction, multiplication, division)
- M7 Integers (addition, subtraction, multiplication, division)
- M8 Percents
- M9 Algebraic Operations
  - A1 Numeration (ordering, place value, scientific notation)
  - A2 Number Theory (ratio, proportion)
  - A3 Data Interpretation (graph, table, chart, diagram)
  - A4 Pre-Algebra and Algebra (equations, inequality)
  - A5 Measurement (money, time, temperature, length, area, volume)
  - A6 Geometry (angles, Pythagorean theory)
  - A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
  - A8 Estimation (rounding, estimation)
- L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
- L2 Sentence Formation (fragments, run-on, clarity)
- L3 Paragraph Development (topic sentence, supporting sentence, sequence)
- L4 Capitalization (proper noun, titles)
- L5 Punctuation (comma, semicolon)
- L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
- S1 Vowel (short, long)
S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

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21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

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Web Site

Course Name: Garden Center Management

Course Abbreviation: HLT 2513

Classification: Vocational–Technical Elective

Description: A course to develop knowledge and skills associated with management of a retail garden center, this course includes instruction in basic principles of entrepreneurship as applied to garden centers, product display and advertising, and facilities. (3 sch: 2-hr lecture, 2-hr lab)

Prerequisite: None

<table>
<thead>
<tr>
<th>Competencies and Suggested Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Describe the business principles associated with acquiring, organizing, and operating a garden center. Block 1, Block 7, Block 8</td>
</tr>
<tr>
<td>a. Describe the advantages and disadvantages of the different forms of business ownership.</td>
</tr>
<tr>
<td>b. Discuss considerations to be taken into account in purchasing an existing business.</td>
</tr>
<tr>
<td>c. Generate a budget for going into business to include facility and inventory acquisition expenses, operating expenses, and income for 1 year.</td>
</tr>
<tr>
<td>d. Identify capital sources for start-up of a garden center business.</td>
</tr>
</tbody>
</table>

2. Explain the concepts necessary to build a garden center business to include choosing a location, merchandising and promotion techniques, facilities maintenance, and public relations. Block 1, Block 4, Block 5, Block 6, Block 8, Block 17, Block 30 |
| a. Describe factors to include in a personnel management and training program for employees. |
| b. Describe factors that affect the development of an image for a business. |
| c. Discuss factors to consider in selecting a location for a garden center business. |
| d. Describe factors to consider in organizing and displaying products and plant materials for optimum merchandising. |
| e. Discuss and contrast the different means of advertising. |
| f. Develop a plan for keeping facilities, display area, and plants in the inventory clean, attractive, and well-maintained. |

3. Design a profitable financial management system. Block 1 |
| a. Develop a pricing system that takes into account overhead costs and provides a reasonable profit. |

STANDARDS

Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses

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Certified Landscape Professional
Block 1 Corporate Financial Management
Block 4 Human Resources
Block 5 Leadership and Corporate Citizenship
Block 6 Marketing and Sales Management
Block 7 Risk, Law, and Contracts
Block 8 Strategic Planning

Certified Landscape Technician - Interior
Block 17 Customer Relations

Mississippi Certified Nurseryman’s Certificate
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Mississippi Nursery and Landscape Association
Block 30 Displaying and Marketing

Related Academic Standards

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary–paraphrase, compare–contrast, cause–effect)
R5 Evaluate and Extend Meaning (fact–opinion, predict outcomes, point of view)
M1 Addition of Whole Numbers (no regrouping, regrouping)
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M3 Multiplication of Whole Numbers (no regrouping, regrouping)
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M5 Decimals (addition, subtraction, multiplication, division)
M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents
M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)
A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
SUGGESTED REFERENCES


Garden center merchandizing and management [Magazine]. Fort Worth, TX: Branch Smith.
Course Name: Landscape Design II

Course Abbreviation: HLT 2523

Classification: Vocational–Technical Elective (Horticulture Technology, Landscape Management Technology)

Description: This course is a continuation of Landscape Design I with emphasis on planting design and preparation and presentation of landscape plans using computer-aided landscape software. (3 sch: 1-hr lecture, 4-hr lab)

Prerequisite: Landscape Design I (HLT 1513)

### Competencies and Suggested Objectives

<table>
<thead>
<tr>
<th>Competencies and Suggested Objectives</th>
<th>Block 18, Block 19</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.</strong> Describe and illustrate basic planting design techniques.</td>
<td></td>
</tr>
<tr>
<td>a. Produce appropriate plant combinations.</td>
<td></td>
</tr>
<tr>
<td>b. Incorporate site amenities with appropriate plant combinations.</td>
<td></td>
</tr>
<tr>
<td>c. Complete landscape design to include plant combinations and site amenities.</td>
<td></td>
</tr>
<tr>
<td><strong>2.</strong> Describe and explore the use of computer software used in the preparation of landscape plans and drawings pertaining to the green industry.</td>
<td>Block 18, Block 19</td>
</tr>
<tr>
<td>a. Review different landscape design computer software used in preparing landscape plans and drawings.</td>
<td></td>
</tr>
<tr>
<td>b. Complete software-specific tutorial exercises for landscape design software.</td>
<td></td>
</tr>
<tr>
<td>c. Prepare residential and commercial landscape plans utilizing landscape design computer software.</td>
<td></td>
</tr>
<tr>
<td><strong>3.</strong> Describe and explore sustainable practices in the green industry.</td>
<td>Block 18, Block 26, Block 27, Block 28, Block 29, Block 30</td>
</tr>
</tbody>
</table>

### STANDARDS

**Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses**

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Certified Landscape Technician - Exterior
Block 18 Softscape Installation
Block 19 Hardscape Installation
Related Academic Standards

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary–paraphrase, compare–contrast, cause–effect)
R5 Evaluate and Extend Meaning (fact–opinion, predict outcomes, point of view)
M1 Addition of Whole Numbers (no regrouping, regrouping)
M2 Subtraction of Whole Numbers (no regrouping, regrouping)
M3 Multiplication of Whole Numbers (no regrouping, regrouping)
M4 Division of Whole Numbers (no remainder, remainder)
M5 Decimals (addition, subtraction, multiplication, division)
M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents
M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)
A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
S1 Vowel (short, long)
S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

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21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills
SUGGESTED REFERENCES


Course Name: Landscape Construction

Course Abbreviation: HLT 2713

Classification: AOC Core (Landscape Management Technology, Golf/Recreational Turf Management Technology), Vocational–Technical Elective (Horticulture Technology)

Description: This course provides instruction and practice in the installation of a landscape plan to include site preparation, installation of site amenities, bed preparation and planting, and shrub and tree planting. (3 sch: 1-hr lecture, 4-hr lab)

Prerequisite: None

Competencies and Suggested Objectives

<table>
<thead>
<tr>
<th>Competency</th>
<th>Block</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Develop a plan for sequencing and timing the different events and operations required for a landscape installation job.</td>
<td>Block 8</td>
</tr>
<tr>
<td>a. Develop a plan for basic site preparation operations to include grading, filling, addition of soil amendments, and soil tillage and preparation.</td>
<td></td>
</tr>
<tr>
<td>b. Describe the installation of hardscape in the landscape industry.</td>
<td></td>
</tr>
<tr>
<td>c. Describe the process for booking and scheduling materials used on a landscape job.</td>
<td></td>
</tr>
<tr>
<td>d. Lay out and install a landscape bed.</td>
<td></td>
</tr>
<tr>
<td>e. Install trees and shrubs as per specifications on drawings.</td>
<td></td>
</tr>
<tr>
<td>f. Describe the concept and implication of a landscape warranty.</td>
<td></td>
</tr>
<tr>
<td>2. Discuss drainage problems in the landscape.</td>
<td>Block 19, Block 25</td>
</tr>
<tr>
<td>a. Describe and contrast the different ways to solve drainage and erosion problems in a landscape.</td>
<td></td>
</tr>
<tr>
<td>b. Measure grades and elevations.</td>
<td></td>
</tr>
<tr>
<td>c. Calculate volumes of landscape materials.</td>
<td></td>
</tr>
<tr>
<td>3. Explain state regulations required to obtain a landscape gardener’s license.</td>
<td>Block 7</td>
</tr>
<tr>
<td>a. Describe state regulations required to obtain a landscape gardener’s license.</td>
<td></td>
</tr>
<tr>
<td>4. Describe and explore sustainable practices in the green industry.</td>
<td>Block 18, Block 26, Block 27, Block 28, Block 29, Block 30</td>
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Certified Landscape Professional
Block 7 Risk, Law, and Contracts
Block 8 Strategic Planning

Certified Landscape Technician - Exterior
Block 18 Softscape Installation
Block 19 Hardscape Installation

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Mississippi Nursery and Landscape Association
Block 25 Landscaping
Block 26 Turf
Block 27 Small Fruits and Nuts
Block 28 Interior Plant Care
Block 29 Poisonous Plants
Block 30 Displaying and Marketing

**Related Academic Standards**

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary–paraphrase, compare–contrast, cause–effect)
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A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
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21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES


Course Name: Integrated Production Systems

Course Abbreviation: AQC/HLT 2724

Classification: Vocational–Technical Elective

Description: This course utilizes basic horticulture practices and aquaculture facilities to provide techniques and procedures to maintain a recirculating hydroponic system. (4 sch: 1-hr lecture, 6-hr lab)

Prerequisite: Water Quality Management (AQC 1214) and Plant Materials I (HLT 1114) or by permission of instructor

Competencies and Suggested Objectives

1. Comprehend a combined recirculation system for hydroponics and aquaculture. (Block 19)
   a. Observe and discuss the processes and principles of the recirculation system.
   b. Comprehend the growth and development processes of plants involved in hydroponics.
   c. Comprehend the growth and development processes of aquatic species involved in hydroponics.

2. Operate and maintain a combined recirculation system for hydroponics and aquaculture. (Block 19)
   a. Observe the operation and maintenance of a combined recirculation system for hydroponics and aquaculture.
   b. Perform daily tasks involved in the operation and maintenance of the combined recirculation system for hydroponics and aquaculture.

STANDARDS

Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses

The following standards were adapted from the publication Occupational Analysis: Certification Standards for Landscape Professional, as published by the Professional Landcare Network (PLANET) and the Canadian Nursery Landscape Association, and from testing materials for Certified Landscape Technician—Exterior and Certified Landscape Technician—Interior, as published by PLANET. For more information on the PLANET certifications, go to the Association Web site at http://www.landcarenetwork.org.

Certified Landscape Technician—Exterior
Block 19  Hardscape Installation

Related Academic Standards

R1  Interpret Graphic Information (forms, maps, reference sources)
R2  Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary–paraphrase, compare–contrast, cause–effect)
R5 Evaluate and Extend Meaning (fact–opinion, predict outcomes, point of view)
M1 Addition of Whole Numbers (no regrouping, regrouping)
M2 Subtraction of Whole Numbers (no regrouping, regrouping)
M3 Multiplication of Whole Numbers (no regrouping, regrouping)
M4 Division of Whole Numbers (no remainder, remainder)
M5 Decimals (addition, subtraction, multiplication, division)
M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents
M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)
A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
S1 Vowel (short, long)
S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

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21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES


Course Name: Water Garden Design

Course Abbreviation: AQC/HLT 2734

Classification: Vocational–Technical Elective

Description: This course is a study of the design and construction of water gardens. (4 sch: 1-hr lecture, 6-hr lab.)

Prerequisite: Facilities Design and Construction (AQC 1313); or Plant Materials I (HLT 1114), Plant Materials II (HLT 1124), and Landscape Design I (HLT 1513)

<table>
<thead>
<tr>
<th>Competencies and Suggested Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Explore various water garden designs.</strong> Block 19</td>
</tr>
<tr>
<td>a. Discuss the location of water gardens, i.e., topography, soil composition, light intensity.</td>
</tr>
<tr>
<td>b. Examine pond environments, i.e., concrete, soil, plastic bottom.</td>
</tr>
<tr>
<td>c. Describe pond aesthetics, i.e., land and water plants and fish.</td>
</tr>
<tr>
<td><strong>2. Design a water garden.</strong> Block 19</td>
</tr>
<tr>
<td>a. Establish location and pond type.</td>
</tr>
<tr>
<td>b. Determine pond systems such as filtration, aeration, and so forth.</td>
</tr>
<tr>
<td>c. Identify the proper construction and hardscape materials required to create the pond environment.</td>
</tr>
<tr>
<td>d. Generate a construction plan.</td>
</tr>
<tr>
<td>e. Formulate a landscape and an aquascape layout for the pond.</td>
</tr>
</tbody>
</table>

STANDARDS

Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses

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Certified Landscape Technician - Exterior
Block 19 Hardscape Installation

Related Academic Standards

- R1 Interpret Graphic Information (forms, maps, reference sources)
- R2 Words in Context (same and opposite meaning)
- R3 Recall Information (details, sequence)
- R4 Construct Meaning (main idea, summary–paraphrase, compare–contrast, cause–effect)
R5 Evaluate and Extend Meaning (fact–opinion, predict outcomes, point of view)
M1 Addition of Whole Numbers (no regrouping, regrouping)
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M6 Fractions (addition, subtraction, multiplication, division)
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M8 Percents
M9 Algebraic Operations
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A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
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21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
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CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES


Postsecondary Horticulture Cluster


**Course Name:** Aquarium and Water Garden Production

**Course Abbreviation:** AQC/HLT 2744

**Classification** Vocational–Technical Elective (Horticulture Technology, Landscape Management Technology)

**Description:** This course includes basic production of the aquarium trade and water garden trade species. (4 sch: 1-hr lecture, 6-hr lab-)

**Prerequisite:** Aquaculture Production I (AQC 1424) or by permission of instructor

**Competencies and Suggested Objectives**

<table>
<thead>
<tr>
<th>1. Recognize and practice production methods of aquarium trade and water garden animal species. <strong>Block 19</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Discuss the various production methods for freshwater and saltwater aquarium animal species.</td>
</tr>
<tr>
<td>b. Demonstrate the production methods for aquarium animal species.</td>
</tr>
<tr>
<td>c. Demonstrate the production methods for water garden animal species.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Recognize and practice production methods of aquarium trade and water garden plant species. <strong>Block 19</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Discuss the various production methods for freshwater and saltwater aquarium plant species.</td>
</tr>
<tr>
<td>b. Demonstrate the production methods for aquarium plant species.</td>
</tr>
<tr>
<td>c. Demonstrate the production methods for water garden plant species.</td>
</tr>
</tbody>
</table>

**STANDARDS**

**Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses**

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Certified Landscape Technician - Exterior
Block 19 Hardscape Installation

**Related Academic Standards**

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary—paraphrase, compare—contrast, cause—effect)
R5 Evaluate and Extend Meaning (fact—opinion, predict outcomes, point of view)
M1 Addition of Whole Numbers (no regrouping, regrouping)
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M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
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A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
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21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES


Postsecondary Horticulture Cluster


Course Name: Ornamental and Turf Pest Management

Course Abbreviation: HLT 2813

Classification: Vocational–Technical Core

Description: This course provides instruction and practice in the identification and control of ornamental turf pests and diseases. This course includes instruction in pest identification, pesticide use and safety, and legal aspects of pest control. (3 sch: 2-hr lecture, 2-hr lab)

Prerequisite: None

Competencies and Suggested Objectives

1. Describe and explain the different types of insects associated with landscape and horticulture plant material. Block 2, Block 9, Block 10, Block 11, Block 15, Block 16, Block 18, Block 19, Block 21, Block 23, Block 24, Block 27
   a. Identify a minimum of 16 orders of insect phylum, and describe the characteristics common to each.
   b. Describe the different life cycles of insects.
   c. Identify and describe the damage caused by insects, and state the control methods.
   d. Collect samples of a minimum of 10 orders and 25 insects.

2. Describe and explain the different types of disease common to ornamental and turf plants. Block 2, Block 9, Block 10, Block 11, Block 15, Block 16, Block 18, Block 19, Block 21, Block 23, Block 24, Block 27
   a. Identify a minimum of 10 bacterial and fungi diseases.
   b. Describe the different life cycles of diseases.
   c. Identify and describe the damage caused by diseases, and state the control methods.
   d. Collect samples of a minimum of 10 diseases common to ornamental and turf plants.

3. Describe control methods for insects and disease management. Block 2, Block 9, Block 10, Block 11, Block 15, Block 16, Block 18, Block 19, Block 21, Block 23, Block 24, Block 27
   a. Identify the different pesticide formulations, and describe the application procedures.
   b. Describe pesticide safety to include toxicity and health, storage, material safety data sheets, application procedures, first aid, and the effects on the environment.
   c. Interpret information found on pesticide labels.
   d. Discuss integrated pest management (IPM) and holistic pest management (HPM).
   e. Identify laws and regulations governing pesticide applicators.
   f. Apply for and take private/commercial pesticide applicator’s certification exam and ornamental and turf pesticide applicator’s exam (Category 3).

STANDARDS

Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses

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published by PLANET. For more information on the PLANET certifications, go to the Association Web site at http://www.landcarenetwork.org.

Certified Landscape Professional
Block 2 - Exterior Production/Operations and Horticulture

Certified Landscape Technician - Interior
Block 9  Pesticides
Block 10  Plant Identification
Block 11  Safety
Block 15  Insects
Block 16  Disease

Certified Landscape Technician - Exterior
Block 18  Softscape Installation
Block 21  Ornamental Maintenance

Mississippi Certified Nurseryman’s Certificate
The standards below were adopted from the training materials for the Mississippi Certified Nursery Professional Certificate sponsored by the Mississippi Nursery and Landscape Association (MNLA). For more information on this certification, go to the MNLA Web site at www.msnla.org.

Mississippi Nursery and Landscape Association
Block 23  Cultural Practices
Block 24  Pest Control
Block 27  Small Fruits and Nuts

Related Academic Standards

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary–paraphrase, compare–contrast, cause–effect)
R5 Evaluate and Extend Meaning (fact–opinion, predict outcomes, point of view)
M1 Addition of Whole Numbers (no regrouping, regrouping)
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M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents
M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)
A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
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21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES


Course Name: Irrigation and Lighting Systems

Course Abbreviation: HLT 2824

Classification: AOC Core (Landscape Maintenance Technology), Vocational–Technical Elective (Horticulture Technology)

Description: This course is designed to investigate the types of irrigation and lighting systems. Discussion will include the installation and maintenance of these systems. (4 sch: 2-hr lecture, 4-hr lab)

Prerequisite: Landscape Design I (HLT 1513)

<table>
<thead>
<tr>
<th>Competencies and Suggested Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Describe the basic components of an irrigation system.</td>
</tr>
<tr>
<td>a. Discuss the past, present, and future types of irrigation systems.</td>
</tr>
<tr>
<td>b. Describe the basic components such as sprinkler heads, controllers, fitting, emitters, valves, back flow devices, and pipe.</td>
</tr>
<tr>
<td>2. Describe and discuss the general design of an irrigation system.</td>
</tr>
<tr>
<td>a. Differentiate between commercial and residential irrigation systems.</td>
</tr>
<tr>
<td>b. Determine the correct location of the sprinkler head/emitters for even water distribution.</td>
</tr>
<tr>
<td>c. Calculate the correct pipe sizes to reduce friction loss.</td>
</tr>
<tr>
<td>d. Compare the efficiencies of spray, rotary, and impact drive heads.</td>
</tr>
<tr>
<td>e. Explain static pressure, working pressure, surge pressure, velocity, and friction loss on a simple irrigation system.</td>
</tr>
<tr>
<td>f. Determine watering time needed per week depending on type of irrigation system and soil type.</td>
</tr>
<tr>
<td>3. Calculate the cost estimate of a simple irrigation system.</td>
</tr>
<tr>
<td>a. Determine the price of the irrigation components from the information supplied.</td>
</tr>
<tr>
<td>b. Determine the cost estimate for installation of the irrigation system to include labor, equipment, supplies, and contingencies.</td>
</tr>
<tr>
<td>4. Describe the methods and procedures to follow in the installation of an irrigation system.</td>
</tr>
<tr>
<td>a. Explain the laying out of an irrigation system to include the tools and equipment necessary.</td>
</tr>
<tr>
<td>b. Describe the installation process including pipe fitting, starting and finishing points, system testing, and cleanup.</td>
</tr>
<tr>
<td>5. Discuss the procedures to follow and the equipment to be used in maintaining and troubleshooting an irrigation system.</td>
</tr>
<tr>
<td>a. Explain the process to follow when locating hydraulic leaks and electrical or mechanical failure.</td>
</tr>
<tr>
<td>b. Identify and use the equipment necessary to maintain an electrical or hydraulic sprinkler system.</td>
</tr>
<tr>
<td>6. Describe the types and basic components of outdoor lighting.</td>
</tr>
<tr>
<td>a. Discuss uses of landscape lighting.</td>
</tr>
</tbody>
</table>
### Writing Team Draft

<table>
<thead>
<tr>
<th>7. Discuss the design of a lighting system. Block 22, Block 25</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Differentiate between residential and commercial lighting systems.</td>
</tr>
<tr>
<td>b. Differentiate between low-voltage and high-voltage lighting systems and the installation process for each.</td>
</tr>
<tr>
<td>c. Discuss automated and manual systems.</td>
</tr>
<tr>
<td>d. Calculate wiring to install a lighting system.</td>
</tr>
<tr>
<td>e. Install an outdoor lighting system.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>8. Calculate a cost estimate of an outdoor lighting system. Block 22, Block 25</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Determine a component cost of a lighting system.</td>
</tr>
<tr>
<td>b. Determine an estimate for installation to include labor, materials, and contingencies.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>9. Describe methods in the installation of an outdoor lighting system. Block 22, Block 25</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Discuss the layout of a lighting system to include tools and equipment necessary.</td>
</tr>
<tr>
<td>b. Describe the installation process of the lighting system to include wiring, starting and finishing points, system testing, and cleanup.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10. Discuss the procedures to follow and the equipment to be used in maintaining a lighting system. Block 22, Block 25</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. Describe and explore sustainable practices in the green industry. Block 18, Block 26, Block 27, Block 28, Block 29, Block 30</td>
</tr>
</tbody>
</table>

### STANDARDS

**Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses**

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Certified Landscape Technician - Interior  
Block 12 Watering/Sub-irrigation

Certified Landscape Technician - Exterior  
Block 18 Softscape Installation  
Block 22 Irrigation

**Mississippi Certified Nurseryman’s Certificate**

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Mississippi Nursery and Landscape Association
Block 25  Landscaping
Block 26  Turf
Block 27  Small Fruits and Nuts
Block 28  Interior Plant Care
Block 29  Poisonous Plants
Block 30  Displaying and Marketing

**Related Academic Standards**

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary–paraphrase, compare–contrast, cause–effect)
R5 Evaluate and Extend Meaning (fact–opinion, predict outcomes, point of view)
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M8 Percents
M9 Algebraic Operations
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A2 Number Theory (ratio, proportion)
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A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
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21st Century Skills

CS1 Global Awareness
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CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES


Web Site

Course Name: Special Problem in Horticulture Cluster

Course Abbreviation: HLT 291(1–3)

Classification: Vocational–Technical Elective

Description: This course is designed to provide the student with practical application of skills and knowledge gained in other vocational–technical courses. The instructor works closely with the student to ensure that the selection of a project will enhance the student’s learning experience. (1–3 sch: 2- to 6-hr lab)

Prerequisite: Consent of instructor

<table>
<thead>
<tr>
<th>Competencies and Suggested Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Prepare a written agreement.</td>
</tr>
<tr>
<td>a. Compile a written training agreement in cooperation with the instructor and student that details a work schedule and specific tasks/skills to be mastered in the program.</td>
</tr>
<tr>
<td>2. Prepare a written report of activities.</td>
</tr>
<tr>
<td>a. Compile a daily log of activities and tasks.</td>
</tr>
<tr>
<td>b. Submit weekly reports summarizing activities and tasks completed to the instructor.</td>
</tr>
<tr>
<td>c. Submit a final report of activities and experiences.</td>
</tr>
<tr>
<td>3. Follow written guidelines for work experience programs.</td>
</tr>
<tr>
<td>a. Complete all required activities in the training agreement.</td>
</tr>
<tr>
<td>b. Adhere to all written and oral instructions for the supervised experience.</td>
</tr>
</tbody>
</table>

STANDARDS

Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses

Specific standards for this course will depend upon the nature of the problem under investigation.

Suggested References

Specific references for use in this course will depend upon the nature of the problem under investigation.
Course Name: Supervised Work Experience in Horticulture Cluster

Course Abbreviation: HLT 292(1–6)

Classification: HLT 292(1–6)

Classification: Vocational–Technical Elective

Description: This course is a cooperative program between industry and education and is designed to integrate the student’s technical studies with industrial experience. Variable credit is awarded on the basis of 1 semester hour per 45 industrial contact hours. (1–6 sch: 3- to 18-hr externship)

Prerequisite: Consent of instructor

<table>
<thead>
<tr>
<th>Competencies and Suggested Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Apply technical skills needed to be a viable member of the workforce.</td>
</tr>
<tr>
<td>a. Prepare a description of technical skills to be developed in the supervised work experience.</td>
</tr>
<tr>
<td>b. Develop technical skills needed to be a viable member of the workforce.</td>
</tr>
<tr>
<td>2. Apply skills developed in other program area courses.</td>
</tr>
<tr>
<td>a. Perform skills developed in other program area courses.</td>
</tr>
<tr>
<td>3. Apply human relationship skills.</td>
</tr>
<tr>
<td>a. Use proactive human relationship skills in the supervised work experience.</td>
</tr>
<tr>
<td>4. Apply and practice positive work habits and responsibilities.</td>
</tr>
<tr>
<td>a. Perform assignments to develop work habits and responsibilities.</td>
</tr>
<tr>
<td>5. Work with the instructor and employer to develop written occupational objectives to be accomplished.</td>
</tr>
<tr>
<td>a. Perform written occupational objectives in the supervised work experience.</td>
</tr>
<tr>
<td>6. Assess accomplishment of objectives.</td>
</tr>
<tr>
<td>a. Prepare daily written assessment of accomplishment of objectives.</td>
</tr>
<tr>
<td>b. Present weekly written reports of activities performed and objectives accomplished to the instructor.</td>
</tr>
<tr>
<td>7. Utilize a set of written guidelines for the supervised work experience.</td>
</tr>
<tr>
<td>a. Develop and follow a set of written guidelines for the supervised work experience.</td>
</tr>
</tbody>
</table>

STANDARDS

Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses

Specific standards for this course will depend upon the nature of the supervised experience program.
Suggested References

Golf/Recreational Turf Management Technology Courses

Course Name: Golf Course Equipment Operation and Maintenance

Course Abbreviation: GTT 1614

Classification: AOC Core (Golf/Recreational Turf Management Technology)

Description: This course aims to provide instruction and practice in the safe and proper operation and maintenance of golf course equipment. (4 sch: 2-hr lecture, 4-hr lab)

Prerequisite: None

Competencies and Suggested Objectives

<table>
<thead>
<tr>
<th>Competency</th>
<th>Suggested Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Demonstrate proper maintenance, handling, and storage of golf course maintenance equipment. Block 20, Block 21</td>
</tr>
<tr>
<td>a.</td>
<td>Identify power equipment used in golf maintenance, and describe the equipment’s function or use.</td>
</tr>
<tr>
<td>b.</td>
<td>Describe storage procedures for maintenance equipment.</td>
</tr>
<tr>
<td>c.</td>
<td>Use an operator’s manual to determine maintenance and storage procedures, fuel and lubricant specifications, and operating procedures for a specific piece of equipment.</td>
</tr>
<tr>
<td>d.</td>
<td>Perform owner–operator maintenance on a diesel tractor to include checking fluid levels, changing oil and filters, servicing air filter, bleeding fuel system, and so forth.</td>
</tr>
<tr>
<td>2.</td>
<td>Describe basic first aid and safety precautions for using golf course maintenance equipment. Block 11</td>
</tr>
<tr>
<td>a.</td>
<td>Describe basic first aid procedures for treating shock, heat stroke, cuts, burns, poisoning, and so forth.</td>
</tr>
<tr>
<td>b.</td>
<td>Describe safety precautions to be followed in working with golf course equipment and supplies.</td>
</tr>
<tr>
<td>3.</td>
<td>Demonstrate safe and proper operation of golf course maintenance equipment and supplies. Block 11</td>
</tr>
<tr>
<td>a.</td>
<td>Demonstrate the ability to properly and safely operate the following equipment: push mower, string trimmer, edger, chain saw, hedge trimmer, blowers, backpack sprayer, tiller, spreader, and so forth.</td>
</tr>
<tr>
<td>b.</td>
<td>Operate a tractor or greens mower safely and properly.</td>
</tr>
<tr>
<td>c.</td>
<td>Safely and properly attach and operate implements and tractor-mounted equipment including box blade, front-end loader, spray rig, mowers, and so forth.</td>
</tr>
<tr>
<td>4.</td>
<td>Demonstrate maintenance of two- and four-stroke gasoline engines. Block 20</td>
</tr>
<tr>
<td>a.</td>
<td>Differentiate between two-stroke and four-stroke gasoline engines.</td>
</tr>
<tr>
<td>b.</td>
<td>Perform owner–operator maintenance on a two-stroke engine to include mixing oil and fuel, servicing air filters, replacing spark plugs, and so forth.</td>
</tr>
<tr>
<td>c.</td>
<td>Perform owner–operator maintenance on a four-stroke engine to include checking/changing oil, servicing air filters, replacing spark plugs, and so forth.</td>
</tr>
<tr>
<td>5.</td>
<td>Explain a working knowledge of small engine nomenclature, function, and purpose. Block 20</td>
</tr>
<tr>
<td>a.</td>
<td>Demonstrate the ability to perform repairs on equipment in the field and troubleshooting as needed.</td>
</tr>
</tbody>
</table>
6. Demonstrate proper procedures for maintaining reel mowing equipment used on golf courses and sports fields. **Block 20**  
   a. Perform adjustment and back lapping procedures on reel mower.  
   b. Explain procedures for setting up and grinding reels.  
   c. Demonstrate proper height adjustments for reel mowers to maintain healthy turf.  
7. Perform equipment calibrations on liquid and granular equipment spreaders. **Block 26**  
8. Prepare cost/performance analysis for various types of equipment. **Block 26**  
9. Identify and demonstrate the steps in over seeding cool season grasses. **Block 26**  
10. List strengths and weaknesses of cool season grasses. **Block 26**

**STANDARDS**

*Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses*

The following standards were adapted from the publication *Occupational Analysis: Certification Standards for Landscape Professional*, as published by the Professional Landcare Network (PLANET) and the Canadian Nursery Landscape Association, and from testing materials for Certified Landscape Technician—Exterior and Certified Landscape Technician—Interior, as published by PLANET. For more information on the PLANET certifications, go to the Association Web site at [http://www.landcarenetwork.org](http://www.landcarenetwork.org).

Certified Landscape Technician - Interior  
Block 11 Safety

Certified Landscape Technician - Exterior  
Block 20 Turf Maintenance  
Block 21 Ornamental Maintenance

Mississippi Certified Nurseryman’s Certificate  
The standards below were adopted from the training materials for the Mississippi Certified Nursery Professional Certificate sponsored by the Mississippi Nursery and Landscape Association (MNLA). For more information on this certification, go to the MNLA Web site at [www.msnla.org](http://www.msnla.org).

Mississippi Nursery and Landscape Association  
Block 26 Turf

*Related Academic Standards*

R1 Interpret Graphic Information (forms, maps, reference sources)  
R2 Words in Context (same and opposite meaning)  
R3 Recall Information (details, sequence)  
R4 Construct Meaning (main idea, summary–paraphrase, compare–contrast, cause–effect)  
R5 Evaluate and Extend Meaning (fact–opinion, predict outcomes, point of view)  
M1 Addition of Whole Numbers (no regrouping, regrouping)
M2 Subtraction of Whole Numbers (no regrouping, regrouping)
M3 Multiplication of Whole Numbers (no regrouping, regrouping)
M4 Division of Whole Numbers (no remainder, remainder)
M5 Decimals (addition, subtraction, multiplication, division)
M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents
M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)
A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
S1 Vowel (short, long)
S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

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21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES


Web Site

Course Name: Golf Course Business Management

Course Abbreviation: GTT 2313

Classification: AOC Core (Golf/Recreational Turf Management Technology)

Description: A course to provide instruction and practice regarding the management of a golf course operation, this course includes instruction in estimating and bidding; personnel management and supervision; and business practices. (3 sch: 3-hr lecture)

Prerequisite: None

Competencies and Suggested Objectives

<table>
<thead>
<tr>
<th>1. Discuss entrepreneurship opportunities in the golf industry.</th>
<th>Block 1, Block 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Describe factors to consider in making a decision to open a business.</td>
<td></td>
</tr>
<tr>
<td>b. State sources and procedures for funding a small business.</td>
<td></td>
</tr>
<tr>
<td>c. Describe the advantages and disadvantages of the different forms of business ownership.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Describe procedures and techniques for hiring and retaining employees.</th>
<th>Block 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Discuss methods for training employees.</td>
<td></td>
</tr>
<tr>
<td>b. Describe factors related to employer–employee relationships including insurance, wages and benefits, withholding taxes, performance evaluation, employer liability, and terminations.</td>
<td></td>
</tr>
<tr>
<td>c. Examine laws and regulatory agencies relating to hiring migratory and immigrant labor.</td>
<td></td>
</tr>
<tr>
<td>d. Describe the uses of records in managing a golf course.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Describe the steps in purchasing equipment and materials.</th>
<th>Block 1, Block 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Interpret specifications and working drawings.</td>
<td></td>
</tr>
<tr>
<td>b. Calculate estimates for purchasing process.</td>
<td></td>
</tr>
<tr>
<td>c. Develop a contract for a specific job that includes the following essential elements: working drawings and specifics, general and specific conditions, and methods of payment.</td>
<td></td>
</tr>
<tr>
<td>d. Develop a work schedule for a golf course.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. Develop evaluation tools to assess job performance.</th>
<th>Block 4, Block 5, Block 20, Block 26</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Write a job description for a specific area of employment on a golf course staff.</td>
<td></td>
</tr>
<tr>
<td>b. Develop skill sheets for the different golf course maintenance operations to evaluate employee performance.</td>
<td></td>
</tr>
</tbody>
</table>

| 2. Discuss and perform common turfgrass calculations. | Block 20, Block 26 |

STANDARDS

Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses

The following standards were adapted from the publication Occupational Analysis: Certification Standards for Landscape Professional, as published by the Professional Landcare Network (PLANET) and the Canadian Nursery Landscape Association, and from testing materials for

Postsecondary Horticulture Cluster
Certified Landscape Technician—Exterior and Certified Landscape Technician—Interior, as published by PLANET. For more information on the PLANET certifications, go to the Association Web site at http://www.landcarenetwork.org.

Certified Landscape Professional
Block 1 Corporate Financial Management
Block 4 Human Resources
Block 5 Leadership and Corporate Citizenship
Block 6 Marketing and Sales Management

Certified Landscape Technician - Exterior
Block 20 Turf Maintenance

Mississippi Certified Nurseryman’s Certificate
The standards below were adopted from the training materials for the Mississippi Certified Nursery Professional Certificate sponsored by the Mississippi Nursery and Landscape Association (MNLA). For more information on this certification, go to the MNLA Web site at www.msnla.org.

Mississippi Nursery and Landscape Association
Block 26 Turf

Related Academic Standards

R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary–paraphrase, compare–contrast, cause–effect)
R5 Evaluate and Extend Meaning (fact–opinion, predict outcomes, point of view)
M1 Addition of Whole Numbers (no regrouping, regrouping)
M2 Subtraction of Whole Numbers (no regrouping, regrouping)
M3 Multiplication of Whole Numbers (no regrouping, regrouping)
M4 Division of Whole Numbers (no remainder, remainder)
M5 Decimals (addition, subtraction, multiplication, division)
M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents
M9 Algebraic Operations
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)
A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
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S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

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21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES


Course Name: Turfgrass Management for Golf Courses

Course Abbreviation: GTT 2813

Classification: AOC Core (Golf/Recreational Turf Management Technology)

Description: This course aims to provide instruction and practice in the identification, selection, installation, and management/maintenance of turfgrass for golf courses. (3 sch: 2-hr lecture, 2-hr lab)

Prerequisite: None

Competencies and Suggested Objectives

1. Discuss the role of turfgrass and its importance in the golf course industry. Block 6, Block 26
   a. Discuss the role of turfgrass in golf course management.
   b. Describe the role of the turfgrass manager.
   c. Identify the different types of turfgrasses, and discuss their classification, growth habits, advantages, and disadvantages.
   d. Identify different types of mowing equipment, and describe the uses and limitations of each type.
   e. Describe the role of sod farming in the golf course industry.

2. Describe the steps to establish turfgrass. Block 20, Block 23
   a. Associate soil types and soil modification techniques with management of different turfgrasses.
   b. Discuss the advantages and disadvantages of the different methods of turfgrass establishments.
   c. Establish turfgrasses by seeding, plugging, sprigging, and sodding.
   d. Calculate the proper amount and apply fertilizer and other amendments to meet soil test requirements for fertility and pH adjustment.

3. Describe the maintenance procedures to manage a healthy turf. Block 20
   a. Plan fertilization programs and application schedules for different turfgrasses and modified soils versus native soils.
   b. Discuss factors to consider in planning a mowing program for different turfgrasses including frequency of mowing and mower height for tees, greens, fairways, and roughs.
   c. Discuss and draw a mowing schedule for golf greens relating to direction of daily cut.
   d. Discuss irrigation needs of turf and signs that indicate when irrigation is needed.
   e. Describe and demonstrate cultural practices of turfgrass management including dethatching, aeration, top dressing, vertical cutting, and brushing.

4. Discuss golf course design and management. Block 18, Block 30
   a. Discuss the basic design and layout procedures of a golf course.
   b. Discuss and demonstrate maintenance practices for greens, tees, fairways, bunkers, and roughs.

5. Discuss soil modification for athletic fields and golf courses. Block 18
   a. Discuss complete soil modification.
   b. Discuss partial soil modification.
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>c.</td>
<td>Discuss nutrient management of both modified and partial modified soils.</td>
</tr>
<tr>
<td>6.</td>
<td>Discuss the management practices that affect the speed of play. Block 20, Block 23</td>
</tr>
<tr>
<td>a.</td>
<td>Discuss sequence of events prior to a golf tournament.</td>
</tr>
<tr>
<td>b.</td>
<td>Discuss cultural practices relating to turfgrass and their effects on putting speed.</td>
</tr>
<tr>
<td>7.</td>
<td>Describe over seeding choices for golf courses. Block 23</td>
</tr>
<tr>
<td>a.</td>
<td>Identify the grass species used for golf course over seeding.</td>
</tr>
<tr>
<td>b.</td>
<td>Describe techniques for over seeding success on golf courses and sports turf.</td>
</tr>
<tr>
<td>c.</td>
<td>Identify alternatives and hazards for over seeding grasses.</td>
</tr>
<tr>
<td>8.</td>
<td>Discuss turfgrass stresses. Block 23</td>
</tr>
<tr>
<td>a.</td>
<td>Explain what agents cause stress to grasses.</td>
</tr>
<tr>
<td>b.</td>
<td>Explain how stress can affect grasses.</td>
</tr>
<tr>
<td>c.</td>
<td>Discuss ways to manage and produce turfgrass stresses.</td>
</tr>
<tr>
<td>9.</td>
<td>Discuss turfgrass pests and methods to scout for pests. Block 24</td>
</tr>
</tbody>
</table>

## STANDARDS

### Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses

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Certified Landscape Professional
Block 6 Marketing and Sales Management

Certified Landscape Technician - Exterior
Block 18 Softscape Installation
Block 20 Turf Maintenance

**Mississippi Certified Nurseryman’s Certificate**

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Mississippi Nursery and Landscape Association
Block 23 Cultural Practices
Block 24 Pest Control
Block 26 Turf
Block 30 Displaying and Marketing
Related Academic Standards

R1  Interpret Graphic Information (forms, maps, reference sources)
R2  Words in Context (same and opposite meaning)
R3  Recall Information (details, sequence)
R4  Construct Meaning (main idea, summary–paraphrase, compare–contrast, cause–effect)
R5  Evaluate and Extend Meaning (fact–opinion, predict outcomes, point of view)
M1  Addition of Whole Numbers (no regrouping, regrouping)
M2  Subtraction of Whole Numbers (no regrouping, regrouping)
M3  Multiplication of Whole Numbers (no regrouping, regrouping)
M4  Division of Whole Numbers (no remainder, remainder)
M5  Decimals (addition, subtraction, multiplication, division)
M6  Fractions (addition, subtraction, multiplication, division)
M7  Integers (addition, subtraction, multiplication, division)
M8  Percents
M9  Algebraic Operations
  A1  Numeration (ordering, place value, scientific notation)
  A2  Number Theory (ratio, proportion)
  A3  Data Interpretation (graph, table, chart, diagram)
  A4  Pre-Algebra and Algebra (equations, inequality)
  A5  Measurement (money, time, temperature, length, area, volume)
  A6  Geometry (angles, Pythagorean theory)
  A7  Computation in Context (whole numbers, decimals, fractions, algebraic operations)
  A8  Estimation (rounding, estimation)
L1  Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2  Sentence Formation (fragments, run-on, clarity)
L3  Paragraph Development (topic sentence, supporting sentence, sequence)
L4  Capitalization (proper noun, titles)
L5  Punctuation (comma, semicolon)
L6  Writing Conventions (quotation marks, apostrophe, parts of a letter)
S1  Vowel (short, long)
S2  Consonant (variant spelling, silent letter)
S3  Structural Unit (root, suffix)

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21st Century Skills

CS1  Global Awareness
CS2  Financial, Economic, and Business Literacy
CS3  Civic Literacy
CS4  Information and Communication Skills
CS5  Thinking and Problem-Solving Skills
CS6  Interpersonal and Self-Directional Skills

Postsecondary Horticulture Cluster
SUGGESTED REFERENCES


Course Name: Irrigation Systems: Design and Maintenance

Course Abbreviation: GTT 2824

Classification: AOC Core (Golf/Recreational Turf Management Technology)

Description: This course is designed to investigate the types of irrigation systems. Discussion will include the installation and maintenance of these systems. (4 sch: 2-hr lecture, 4-hr lab)

Prerequisite: None

<table>
<thead>
<tr>
<th>Competencies and Suggested Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Describe the basic components of an irrigation system.</td>
</tr>
<tr>
<td>a. Discuss the past, present, and future types of irrigation systems.</td>
</tr>
<tr>
<td>b. Describe the basic components such as sprinkler heads, controllers, fitting, emitters, valve, back flow devices, and pipe.</td>
</tr>
<tr>
<td>2. Describe and discuss the general design of an irrigation system.</td>
</tr>
<tr>
<td>a. Differentiate between commercial and residential irrigation systems.</td>
</tr>
<tr>
<td>b. Determine the correct location of the sprinkler head/emitters for even water distribution.</td>
</tr>
<tr>
<td>c. Calculate the correct pipe sizes to reduce friction loss.</td>
</tr>
<tr>
<td>d. Compare the efficiencies of spray, rotary, and impact drive heads.</td>
</tr>
<tr>
<td>e. Explain static pressure, working pressure, surge pressure, velocity, and friction loss on a simple irrigation system.</td>
</tr>
<tr>
<td>f. Determine watering time needed per week depending on type of irrigation system and soil type.</td>
</tr>
<tr>
<td>3. Calculate the cost estimate of a simple irrigation system.</td>
</tr>
<tr>
<td>a. Determine the price of the irrigation components from the information supplied.</td>
</tr>
<tr>
<td>b. Determine the cost estimate for installation of the irrigation system to include labor, equipment, supplies, and contingencies.</td>
</tr>
<tr>
<td>4. Describe the methods and procedures to follow in the installation of an irrigation system.</td>
</tr>
<tr>
<td>a. Explain the layout of an irrigation system to include the tools and equipment necessary.</td>
</tr>
<tr>
<td>b. Describe the installation process including pipe fitting, starting and finishing points, system testing, and cleanup.</td>
</tr>
<tr>
<td>5. Discuss the procedures to follow and the equipment to be used in maintaining and troubleshooting an irrigation system.</td>
</tr>
<tr>
<td>a. Explain the process to follow when locating hydraulic leaks and electrical or mechanical failure.</td>
</tr>
<tr>
<td>b. Identify and use the equipment necessary to maintain an electrical or hydraulic sprinkler system.</td>
</tr>
<tr>
<td>6. Discuss different types of pumping stations for golf courses.</td>
</tr>
<tr>
<td>7. Discuss water quality issues for golf courses.</td>
</tr>
</tbody>
</table>

STANDARDS
Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses

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Certified Landscape Technician - Interior
Block 12 Watering/Sub-irrigation

Certified Landscape Technician - Exterior
Block 22 Irrigation

**Related Academic Standards**

| R1 | Interpret Graphic Information (forms, maps, reference sources) |
| R2 | Words in Context (same and opposite meaning) |
| R3 | Recall Information (details, sequence) |
| R4 | Construct Meaning (main idea, summary–paraphrase, compare–contrast, cause–effect) |
| R5 | Evaluate and Extend Meaning (fact–opinion, predict outcomes, point of view) |
| M1 | Addition of Whole Numbers (no regrouping, regrouping) |
| M2 | Subtraction of Whole Numbers (no regrouping, regrouping) |
| M3 | Multiplication of Whole Numbers (no regrouping, regrouping) |
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| M5 | Decimals (addition, subtraction, multiplication, division) |
| M6 | Fractions (addition, subtraction, multiplication, division) |
| M7 | Integers (addition, subtraction, multiplication, division) |
| M8 | Percents |
| M9 | Algebraic Operations |
| A1 | Numeration (ordering, place value, scientific notation) |
| A2 | Number Theory (ratio, proportion) |
| A3 | Data Interpretation (graph, table, chart, diagram) |
| A4 | Pre-Algebra and Algebra (equations, inequality) |
| A5 | Measurement (money, time, temperature, length, area, volume) |
| A6 | Geometry (angles, Pythagorean theory) |
| A7 | Computation in Context (whole numbers, decimals, fractions, algebraic operations) |
| A8 | Estimation (rounding, estimation) |
| L1 | Usage (pronoun, tense, subject–verb agreement, adjective, adverb) |
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| S1 | Vowel (short, long) |
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21st Century Skills

CS1 Global Awareness
CS2 Financial, Economic, and Business Literacy
CS3 Civic Literacy
CS4 Information and Communication Skills
CS5 Thinking and Problem-Solving Skills
CS6 Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES


Recommended Tools and Equipment

CAPITALIZED ITEMS

- Plant Presses (12 per program)
- Plant Collection Storage Unit (4 per program)
- Blue Print Machine with Ammonia Filter Unit (1 per program)
- Sprayer Boom Type, Trailer Mount with 100-gal. Tank (1 per program)
- Color Multi-Pin Plotter
- Electronic Planimeter (3 per program)
- Measuring Wheel (3 per program)
- Stereoscopes without Camera Capabilities (6 per program)
- Networked microcomputer lab with server—20 workstations to include the following:
  - Multimedia computer with CD/DVD-RW, speakers, sound card, internal modem, USB port for jump drive (1 per workstation)
  - Network Color Laser Printer (1 per lab)
  - Network Color Inkjet Printer (3 per lab)
  - Network Scanner, Color Page (1 per lab)
  - Internet Access
- Data Projector with Screen (1 per lab)
- Digital Visual Presenter (1 per lab)
- Digital Video Camera (1 per lab)
- Digital Camera (1 per lab)
- Commercial Soil Mixer
- Germination Chamber
- Tractor, minimum 26 HP (1 per program)
- Utility Vehicle (1 per program)
- Box Blade for Tractor (1 per program)
- Front-End Loader (1 per program)
- 48-in. Grooming Mower Attachment for Tractor (1 per program)
- 48-in. Reel Riding Mower (1 per program)
- 48-in. Rotary Riding Mower (1 per program)
- Zero-Turn Mower (1 per program)
- Walk-Behind Reel Mower, 22 in. (1 per program)
- Walk-Behind Rotary/Self-Propelled, 36 in. (1 per program)
- Commercial String Trimmer (6 per program)
- Commercial Stick Edger (4 per program)
- Commercial Backpack Blower (4 per program)
- Walk-Behind Power Bed Edger (1 per program)
- Spreaders, Tractor Mount (1 per program)
- Top Dresser, Self-Contained (1 per program)
- Aerator, Self-Propelled (1 per program)
- Sod Cutter (1 per program)
- De-Thatcher (1 per program)
- Verti-Cutter (1 per program)
- Truck, V-8, Club Cab, Automatic, Dump Bed, Box Hitch, 1-Ton Min. (1 per program)
Trailer, Double Axle, 16-ft with Ramp (1 per program)  
Sod Roller, Water Fill (1 per program)  
Full Set of Metric Mechanics Tools, 500 pieces (1 per program)  
Full Set of Standard Mechanics Tools, 500 pieces (1 per program)  
Bench Work Tables, Wood/Steel Tops (6 per program)  
Lapping Machine Sharpener for Reel Mower (2 per program)  
Shower Area for Containment of Chemicals (1 per program)  
Ball Carts (2 per program)  
Tree Carts (2 per program)  
Nursery Carts (4 per program)  
Tree Slings, Large and Small (1 each per program)  
Welders, Arc Welder (2 per program)  
Cutting Torches (1 per program)  
50-gal Air Compressor/Industrial Hose and Attachment (1 per program)  
Tiller, Rear Tine (1 per program)  
Tiller, Front Tine (3 per program)  
Chain Saw (1 per program)  
Gas-Powered Hedge Trimmer (1 per program)  
Electric-Powered Hedge Trimmer (1 per program)  
Parts Washer (1 per program)  
Pressure Washer (1 per program)  
Aerator-Tractor Mounted (1 per program)  
Floor Model Drill Press (1 per program)  
Grinder, Reel (1 per program)  
Bed Knife Grinder (1 per program)  
Laser Leveling System  
Fertilizer Proportioner  
Vibratory Plate  
Vibratory Tamp  
Convection Oven  
Chipper/shredder  

NON-CAPITALIZED ITEMS  

Five-Drawer Flat File Storage (2 per program)  
Drafting Table, 36-in. by 48-in. min. (20 per program)  
Parallel Bars, 48 in. (20 per program)  
Board Cover, 36 in. by 48 in. (20 per program)  
Architect Drafting Table Lights (20 per program)  
Drafting Chairs (20 per program)  
Complete Drafting Set (1 per program)  
Electric Eraser (1 per program)  
Insect Boxes (15 per program)  
Spreading Boards (15 per program)  
Tripod for Camera (1 per program)  
Riker Mount, Various Sizes (100 per program)
Insect Nets (12 per program)
Scale: 25-lb Capabilities, Metric and Standard Weighing Scale (1 per program)
Sprayer, Backpack with Agitator (6 per program)
Sprayer Handheld Pump/Pressure, 22-gal. (6 per program)
Sprayer Siphon/Hose On (4 per program)
Markers (150 per program)
Colored Pencils (150 per program)
Tape Measure, 25 ft by 1 in. Steel Tape (12 per program)
Tape Measure, 100 Fiberglass (6 per program)
Tape Measure, 200 Fiberglass (6 per program)
Tripod for Level (1 per program)
Philadelphia Rod, 1/10ths (1 per program)
Paint Stick, Long (2 per program)
Paint Stick, Short (2 per program)
Marking Paint (2 cases per program)
Measuring Cups, Assorted Sizes in Plastic, Glass, and Stainless (24 per program)
Beakers, Various Sizes (24 per program)
Measuring Spoons, Various Sizes (24 sets per program)
Handheld Blower (2 per program)
Push Brooms with Extra Handles (6 per program)
Garden Hoses of Various Sizes (12 per program)
Spreaders, Cyclone/Broadcast (3 per program)
Spreaders, Drop Spreaders (1 per program)
40-ft Chain (1 per program)
Chain Binders (4 per program)
Ratchet Straps (12 per program)
Manual Grease Gun (3 per program)
Tool Boxes, Lockable with Casters (2 per program)
Bench Grinders, 3/4 HP (2 per program)
Bench Vise (6 per program)
Deep stainless steel sink for equipment wash-up and floral design (4 per program)
Shovels, Round Point (12 per program)
Shovels, Square Point (6 per program)
Leaf Rake (12 per program)
Bow Rake (12 per program)
Landscape Rake, 36 in. (4 per program)
Landscape Rake, 24 in. (4 per program)
Water Wands (6 per program)
Sprinklers, Various Types and Sizes (6 per program)
Nozzles, Various Types (6 per program)
Tamps (2 per program)
Wheel Barrow, Steel Tray/Plastic Tray (6 per program)
Complete Soil Test Kit (4 per program)
Soil Sampler (6 per program)
Soil Augers, 1 Power and 2 Manual (3 per program)
PH Meter and Soil Probe (6 per program)
Soil Electro-Conductivity Meter
Pneumatic Wrenches, Full Set (1 per program)
Air Tank, Portable (1 per program)
Gas Cans, 22 gal. (12 per program)
Concrete Hoe (2 per program)
Mattock, Cutting and Digging (2 per program)
Railroad Pick (1 per program)
Hand Saw (1 per program)
Pruning Shears (12 per program)
Loppers (6 per program)
Pole Pruner (4 per program)
Fertilizer Probe (6 per program)
Ladder, 24-ft Extension (1 per program)
Ladder, Step (8 ft) (2 per program)
First Aid Kit (2 per program)
Drill, 2-in. Reversible (2 per program)
Disc Grinder, Portable (4 in.) (2 per program)
Voltage Meter (1 per program)
Short Indicator/Finder (1 per program)
Compression Coupling Wrenches (2 per program)
Wire Cutter/Stripper (6 per program)
Valve Wrenches, 4 ft (4 per program)
Trenching Shovels (4 per program)
Water Key (12 per program)
Zurn Key (2 per program)
Spades (8 per program)
Scoops (4 per program)
Circular Saw (1 per program)
Compound Miter Saw (2 per program)
1-in. Jig Saw (1 per program)
3-in. Belt Sander (1 per program)
Finishing Sander (1 per program)
Hand Pruners (16 per program)
4-ft Level (2 per program)
Climbing Saddles (4 per program)
Safety Lanyard (4 per program)
Rope, Climbing (500 ft) (1 per program)
Graduated Cylinders (1 l) (24 per program)
Additional Equipment for
Golf/Recreational Turf Programs

CAPITALIZED EQUIPMENT

- Triplex Greens Mower
- Fairway Reel Mower
- Reel Grinder
- Global Positioning System Receiver
- Flow Meter
- Irrigation System
- Surface Sweeper

NON-CAPITALIZED ITEMS

- Stemp Meter

RECOMMENDED INSTRUCTIONAL AIDS

It is recommended that instructors have access to the following items:

- Flat Screen TV Monitor (1)
- VCR/DVD Player (1)
- Carousel Slide Projector (1)
- Carousel Trays for Slides (10)
- Computer Software for:
  - Landscape Design and Estimating
  - Irrigation Design and Estimating
  - Word Processing
  - Spread Sheets
  - Plant Materials
  - Greenhouse
  - Crop Estimating
  - Accounting
  - Landscape Maintenance
- Copier (1)
- Fax Machine (1)
Assessment

Blueprint

This program is assessed using the MS-CPAS2. The following blueprint summary contains the competencies that are measured when assessing this program. Competencies are grouped into clusters, and a weight is given to each cluster to determine the number of items needed from each cluster. The numbers of C1s and C2s (item difficulty levels) are also indicated on the blueprint.

Please visit http://info.rcu.msstate.edu/services/curriculum.asp to download the [P] Horticulture blueprint.
Baseline Competencies

The following competencies and suggested objectives are taken from the publication Mississippi Curriculum Framework for Horticulture Technology Cluster. These competencies and objectives represent the baseline that was used to develop the community and junior college Horticulture Technology Cluster courses. Students enrolled in postsecondary courses should either (1) have documented mastery of these competencies or (2) be provided with these competencies before studying the advanced competencies in the Horticulture Technology Cluster program.

Baseline competencies may be integrated into existing courses in the curriculum or taught as special introduction courses. The introduction courses may be taught for up to 6 semester hours of institutional credit and may be divided into two courses. If the baseline competencies are to be taught as introduction courses, each course should be at least 3 credit hours. The following course number(s) and description should be used:

Course Name(s): Introduction to Horticulture Technology Cluster, Introduction to Horticulture Technology Cluster I, or Introduction to Horticulture Technology Cluster II

Course Abbreviation(s): HLT 100(3–6), HLT 1013, HLT 1023

Classification: Vocational–Technical Core

Description: These courses contain the baseline competencies and suggested objectives from the high school curriculum that directly relate to the community college program. The courses are designed for students entering the community college who have had no previous training or documented experience in the field. (3–6 semester hours based upon existing skills for each student may be divided into two courses for a maximum total of 6 hours of institutional credit.)
Appendix A: Proposed Standards for Mississippi Postsecondary Horticulture Cluster Courses

The following standards were adapted from the publication *Occupational Analysis: Certification Standards for Landscape Professional*, as published by the Professional Landcare Network (PLANET) and the Canadian Nursery Landscape Association, and from testing materials for Certified Landscape Technician—Exterior and Certified Landscape Technician—Interior, as published by PLANET. For more information on the PLANET certifications, go to the Association Web site at [http://www.landcarenetwork.org](http://www.landcarenetwork.org).

**PLANET Certified Landscape Professional**

| Block 1 | Corporate Financial Management |
| Block 2 | Exterior Production/Operations and Horticulture |
| Block 3 | Interior Production/Operations and Horticulture |
| Block 4 | Human Resources |
| Block 5 | Leadership and Corporate Citizenship |
| Block 6 | Marketing and Sales Management |
| Block 7 | Risk, Law, and Contracts |
| Block 8 | Strategic Planning |

**Certified Landscape Technician - Interior**

| Block 9 | Pesticides |
| Block 10 | Plant Identification |
| Block 11 | Safety |
| Block 12 | Watering/Sub-irrigation |
| Block 13 | Pruning |
| Block 14 | Fertilization/Nutrition |
| Block 15 | Insects |
| Block 16 | Disease |
| Block 17 | Customer Relations |

**Certified Landscape Technician - Exterior**

| Block 18 | Softscape Installation |
| Block 18 | Common Core (written) |
| Block 18 | Softscape Plan Reading (written) |
| Block 18 | Softscape Horticultural Principles (written) |
| Block 18 | Irrigation Components (written) |
| Block 18 | Plant Identification |
| Block 18 | Basic Program Controller |
| Block 18 | Lateral Repair and Head Adjustment |
| Block 18 | Tree Planting and Staking |
| Block 18 | Sod Installation |
| Block 18 | Plant Layout |
Rototiller

Block 19 Hardscape Installation
Common Core (written)
Hardscape Plan Reading (written)
Hardscape Principles and Calculations (written)
Chain Saw
Grading and Drainage
Instrument
Paver Installation
Skid Steer Operation

Block 20 Turf Maintenance
Common Core (written)
Irrigation Components and Principles (written)
Turfgrass Maintenance Principles (written)
Turfgrass Maintenance Calculations (written)
Basic Program Controller
Lateral Repair and Head Adjustment
Power Blower
21-in. Mower
Intermediate Walk-Behind Mower
Riding Mower
Edger and Trimmer
Aerator
Aerator
Turfb Fertilizer

Block 21 Ornamental Maintenance
Common Core (written)
Irrigation Components and Principles (written)
Ornamental Maintenance Horticultural Principles (written)
Ornamental Maintenance Calculations (written)
Plant Identification
Basic Program Controller
Lateral Repair and Head Adjustment
Tree Planting and Staking
Chain Saw
Power Blower
Pruning

Block 22 Irrigation
Common Core (written)
Advanced Irrigation Components and Principles (written)
Irrigation Plan Reading (written)
Basic Horticultural Principles (written)
Lateral Repair and Head Adjustment
Advanced Program Controller  
Lateral Installation  
Mainline Installation  
Valve Repair  
Valve Wiring  
Pipe Installation Equipment (Trencher or Pipe Puller)

**Mississippi Certified Nurseryman’s Certificate**  
The standards below were adopted from the training materials for the Mississippi Certified Nursery Professional Certificate sponsored by the Mississippi Nursery and Landscape Association (MNLA). For more information on this certification, go to the MNLA Web site at [www.msnla.org](http://www.msnla.org).

**Mississippi Nursery and Landscape Association**

<table>
<thead>
<tr>
<th>Block</th>
<th>Course</th>
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<tbody>
<tr>
<td>23</td>
<td>Cultural Practices</td>
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<td>24</td>
<td>Pest Control</td>
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<tr>
<td>25</td>
<td>Landscaping</td>
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<td>26</td>
<td>Turf</td>
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<td>27</td>
<td>Small Fruits and Nuts</td>
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<td>28</td>
<td>Interior Plant Care</td>
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<td>29</td>
<td>Poisonous Plants</td>
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<tr>
<td>30</td>
<td>Displaying and Marketing</td>
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</tbody>
</table>
Appendix B: Related Academic Standards\(^1\)

**Reading**
R1 Interpret Graphic Information (forms, maps, reference sources)
R2 Words in Context (same and opposite meaning)
R3 Recall Information (details, sequence)
R4 Construct Meaning (main idea, summary–paraphrase, compare–contrast, cause–effect)
R5 Evaluate and Extend Meaning (fact–opinion, predict outcomes, point of view)

**Mathematics Computation**
M1 Addition of Whole Numbers (no regrouping, regrouping)
M2 Subtraction of Whole Numbers (no regrouping, regrouping)
M3 Multiplication of Whole Numbers (no regrouping, regrouping)
M4 Division of Whole Numbers (no remainder, remainder)
M5 Decimals (addition, subtraction, multiplication, division)
M6 Fractions (addition, subtraction, multiplication, division)
M7 Integers (addition, subtraction, multiplication, division)
M8 Percents
M9 Algebraic Operations

**Applied Mathematics**
A1 Numeration (ordering, place value, scientific notation)
A2 Number Theory (ratio, proportion)
A3 Data Interpretation (graph, table, chart, diagram)
A4 Pre-Algebra and Algebra (equations, inequality)
A5 Measurement (money, time, temperature, length, area, volume)
A6 Geometry (angles, Pythagorean theory)
A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
A8 Estimation (rounding, estimation)

**Language**
L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
L2 Sentence Formation (fragments, run-on, clarity)
L3 Paragraph Development (topic sentence, supporting sentence, sequence)
L4 Capitalization (proper noun, titles)
L5 Punctuation (comma, semicolon)
L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)

**Spelling**
S1 Vowel (short, long)
S2 Consonant (variant spelling, silent letter)
S3 Structural Unit (root, suffix)

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Appendix C: 21st Century Skills

CS1 Global Awareness
• Using 21st century skills to understand and address global issues
• Learning from and working collaboratively with individuals representing diverse cultures, religions, and lifestyles in a spirit of mutual respect and open dialogue in personal, work, and community contexts
• Promoting the study of non-English language as a tool for understanding other nations and cultures

CS2 Financial, Economic, and Business Literacy
• Knowing how to make appropriate personal economic choices
• Understanding the role of the economy and the role of business in the economy
• Applying appropriate 21st century skills to function as a productive contributor within an organizational setting
• Integrating one’s self within and adapting continually to the nation’s evolving economic and business environment

CS3 Civic Literacy
• Being an informed citizen to participate effectively in government
• Exercising the rights and obligations of citizenship at local, state, national, and global levels
• Understanding the local and global implications of civic decisions
• Applying 21st century skills to make intelligent choices as a citizen

CS4 Information and Communication Skills
• Information and media literacy skills: analyzing, accessing, managing, integrating, evaluating, and creating information in a variety of forms and media; understanding the role of media in society
• Communication skills: understanding, managing, and creating effective oral, written, and multimedia communication in a variety of forms and contexts

CS5 Thinking and Problem-Solving Skills
• Critical thinking and systems thinking: exercising sound reasoning in understanding and making complex choices; understanding the interconnections among systems
• Problem identification, formulation, and solution: ability to frame, analyze, and solve problems
• Creativity and intellectual curiosity: developing, implementing, and communicating new ideas to others; staying open and responsive to new and diverse perspectives

CS6 Interpersonal and Self-Directional Skills
• Interpersonal and collaborative skills: demonstrating teamwork and leadership, adapting to varied roles and responsibilities, working productively with others, exercising empathy, and respecting diverse perspectives
• Self-direction: monitoring one’s own understanding and learning needs, locating appropriate resources, and transferring learning from one domain to another
• Accountability and adaptability: exercising personal responsibility and flexibility in personal, workplace, and community contexts; setting and meeting high standards and goals for one’s self and others; tolerating ambiguity

• Social responsibility: acting responsibly with the interests of the larger community in mind; demonstrating ethical behavior in personal, workplace, and community contexts