

Discipline: Agriculture	Sub-discipline: Sustainable Agriculture
General Course Title: Agricultural Composting	Min. Units: 1.5 Semester
Proposed Suffix: L	
<p>Course Description: Introduction to organic matter decomposition processes, including soil health, and microbiology, composting approaches. Practical skills required for hot, aerobic composting methods will be emphasized as applied to small commercial fruit, vine and vegetable operations, all types of livestock operations, hay producers, as well as residential and backyard settings.</p>	
Required Prerequisites or Co-Requisites ¹	
Advisories/Recommended Preparation ²	
<p>Course Objectives: <i>At the conclusion of this course, the student should be able to:</i></p> <ul style="list-style-type: none"> • Identify key reasons for and benefits of composting. • Explain the basic process of biological decomposition. • Identify the key compost organisms and the role they play in stages of decomposition. • Build and maintain a compost pile. • Assess a variety of composting materials and their appropriate applications to various scales and settings. • Compare and contrast a variety of composting methods, their purposes, strengths, weaknesses, and appropriate applications. • Identify key factors affecting the aerobic composting process. • Recommend specific compost uses for a variety of settings and discuss timing, application rates, and placement. • Analyze the qualitative characteristics of finished compost. • Identify and utilize compost making tools and proper technical skills required for composting. • Troubleshoot unsuccessful compost piles and recommend appropriate solutions. 	
<p>Course Content:</p> <ol style="list-style-type: none"> 1. Benefits of Compost in the Soil <ol style="list-style-type: none"> A. Improves soil structure B. Increases moisture retention C. Slow release of nutrients D. Increases diversity of microorganisms in soil E. Buffers soil pH F. Suppresses disease G. Increases Cation exchange capacity (CEC) H. Plays a key role in soil fertility management <p>Agricultural Composting (Content Continued)</p> <ol style="list-style-type: none"> 2. Biology of the Composting Process <ol style="list-style-type: none"> A. Basic composting requirements <ol style="list-style-type: none"> 1. Water 2. Air 3. Carbon 4. Nitrogen 	

¹ Prerequisite or co-requisite course need to be validated at the CCC level in accordance with Title 5 regulations; co-requisites for CCCs are the linked courses that must be taken at the same time as the primary or target course.

² Advisories or recommended preparation will not require validation but are recommendations to be considered by the student prior to enrolling.

- 5. Time
- B. Key compost organisms
 - 1. Bacteria
 - 2. Actinomycetes
 - 3. Fungi
 - 4. Macroorganisms
- 3. Compost materials: key considerations
 - A. C-N ratio
 - B. Nitrogenous materials
 - C. Carbon materials
 - D. Animal manures
 - E. Balancing C-N range for composting
 - F. Compost additives
 - G. What *not* to compost
- 4. Composting methods
 - A. Anaerobic
 - B. Aerobic systems
 - 1. Turned windrow
 - 2. Static pile
 - 3. In-vessel
 - C. Vermiculture (worm composting)
 - D. Compost Tea
 - E. Other
- 5. Scale of systems
 - A. Commercial settings
 - B. Agricultural settings
 - C. Residential settings
 - D. Backyard
- 6. Key factors that influence the aerobic composting process
 - A. Carbon to nitrogen ratio
 - B. Surface area
 - C. Volume
 - D. Aeration
 - E. Moisture content
 - F. Temperature
 - G. Microorganisms
 - H. Time
 - I. Management factors

**Agricultural Composting
(Content Continued)**

- 7. Useful compost making tools and proper technical skills
 - A. Useful tools
 - 1. Pitch fork for building and turning piles
 - 2. Sharp spade for chopping materials
 - 3. Hose with on/off sprayer
 - 4. Bin for pile or for stock piling raw materials
 - 5. Large tarp
 - 6. Compost thermometer

<p>7. Data log for recording temperatures</p> <p>B. Technical Skills</p> <ol style="list-style-type: none"> 1. Monitoring 2. Record keeping 3. Management and troubleshooting of compost piles <ol style="list-style-type: none"> a. Pile does not heat up b. Pile overheats c. Ammonia / sulfur odor d. Pile is too wet / too dry 4. Assess quality of finished compost <p>8. Compost regulations</p> <ol style="list-style-type: none"> A. USDA National Organic Program Standards B. County and state regulations for commercial production C. USDA requirements for organic producers <ol style="list-style-type: none"> 1. Raw animal manure 2. Composted plant and animal materials 3. Uncomposted plant materials <p>9. Utilization and application of finished compost</p> <ol style="list-style-type: none"> A. Timing of applications B. Application rates C. Placement D. Commercial Sources of compost and pricing <p>Laboratory Activities: Individual Laboratory Activities are designed to support course objectives.</p>	
<p>Methods of Evaluation: Lecture Comprehensive Quizzes and Exams Written Critical Thinking Scenarios Problem Analysis and Solution Research and Term Papers</p>	<p>Methods of Evaluation: Laboratory Laboratory Skill Validation by Observation Laboratory Projects and Reports Laboratory Research Projects and Reports Laboratory Skill Practicum Exams</p>
<p>Typical Textbooks, Manuals, or Other Support Materials</p> <p><u>The Rodale Book of Composting</u>, By Martin & Gershuny, Rodale Press, 1992.</p> <p><u>Compost Production and Utilization: A Grower's Guide</u>. University of California Agriculture and Natural Resources, 2001.</p> <p><u>Teaching Organic Farming & Gardening: Resources for Instructors</u> Center for Agroecology and Sustainable Food Systems http://zzyx.ucsc.edu/casfs/training/manuals/tofg/index.html</p>	
<p>Statewide Articulation: Transfers as lower division elective</p>	
<p>FDRG Lead Signature:</p> <p>Mark E. Bender, PhD CSU Stanislaus</p>	<p>Date:</p>
<p>[For Office Use Only]</p>	<p>Internal Tracking Number</p>
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