

Discipline: Agriculture	Sub-discipline: Mechanized Agriculture
General Course Title: Small Gas Engines	Min. Units: 3 Semester
Proposed Suffix: L	
<p>Course Description:</p> <p>This is a complete introductory course in the operation, construction, maintenance, repair, and adjustments of two-cycle and four-cycle engines. Designed for persons without prior experience in small engines. Theory and practical work, including safety and the care and use of specialized tools used in small engine repair and maintenance will be covered. Examples of the types of engines to be used will include lawn mower, power saw, pump, conveyor, self-propelled small carts, and any other small engines. Laboratory required.</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"> • Develop an understanding of two and four stroke small engines • Develop basic technical skill and knowledge to perform routine maintenance • Develop basic technical skill and knowledge to perform tune-ups and engine overhauls • Troubleshoot and diagnose small engine problems • Read and understand technical manuals • Develop desirable work habits and attitudes • Write up an explanation of the repairs needed to restore a small gas engine back to working order including the cost involved • Develop skills in communicating with a customer to aid in diagnosing a small gas engine problem • Demonstrate ability to communicate and work cooperatively with others 	
<p>Course Content:</p> <ol style="list-style-type: none"> 1. Introduction to employment opportunities <ol style="list-style-type: none"> a. Mechanic b. Sales and service c. Technician d. Owner-manager 2. Shop and equipment safety <ol style="list-style-type: none"> a. Safety attitudes b. Proper use of hand and power tools c. Fire safety d. Chain saw and machinery safety e. Personal safety 3. Basic operating principles <ol style="list-style-type: none"> a. Engine construction b. Four-stroke cycle operation c. Two-stroke cycle operation <p>Small Gas Engines (Content Continued)</p> <ol style="list-style-type: none"> 4. Identifying engines and using parts books 	

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.

- a. Model designations and their meanings
 - b. Use of repair manuals
 - c. Use of parts manuals
 - d. Engine specifications
 - e. Ordering parts
5. Use of special tools
- a. Micrometers
 - b. Dial bore gauge
 - d. Plastigauge
 - e. Valve grinder
 - f. Dial indicators
 - g. Steam/pressure cleaner
 - h. Glass bead machine
6. Engine troubleshooting and diagnosis
- a. Fuel system
 - b. Electrical system
 - c. Valves
 - d. Rings
 - e. Carburetor
 - f. Air cleaner
 - g. Power train
7. Engine tuneup
- a. Ignition system
 - b. Spark plugs
 - c. Magneto service
 - d. Adjusting and/or replacing points
 - e. Retrofitting point ignition systems to electronic ignition modules where applicable
 - f. Timing
 - g. Valves
 - h. Carburetor
 - i. Air cleaners
 - j. Cooling systems

**Small Gas Engines
(Content Continued)**

8. Engine overhaul
- a. Complete disassembly
 - b. Systems check
 - c. Crankshaft
 - d. Camshaft
 - e. Tappets
 - f. Valves and guides
 - g. Piston
 - h. Rings
 - i. Cylinder reconditioning and boring

<ul style="list-style-type: none"> j. Bearings and bushing replacement k. Governors l. Valve springs and rotators m. Oil dippers, slingers, and pumps n. Crankcase breathers o. Starters <p>9. Cleaning and storing engines</p> <ul style="list-style-type: none"> a. Parts of the system c. Methods of cleaning engine c. Cleaning procedure d. Preparing engine for storage <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 Reports Diagnostics and Problem Solving Laboratory Skill Practicum Certification Exams</p>
<p>Typical Textbooks, Manuals, or Other Support Materials</p> <p style="text-align: center;"><u>Small Gas Engines</u>, Roth, Alfred C., Briggs and Stratton Repair Manual</p>	
<p>Statewide Articulation: CPSLO-BRAE 124, CSUF-MEAG 114*, CSUC-AGET 155, UCD-ABT 101, other universities as lower division elective (*upper division subject matter equivalency, lower division elective units)</p>	
<p>FDRG Lead Signature: _____ Date: _____</p>	
<p>Mark E. Bender, PhD CSU Stanislaus</p>	
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