July 2001
Florida Department of Education
CURRICULUM FRAMEWORK

Program Title: Gasoline Engine Service Technology
Occupational Area: Industrial Education

	Secondary	**PSAV**
Program Numbers	**8766000**	**I470606**
CIP Number	0647.060600	0647.060600
Grade Level	9-12, 30, 31	30,31
Length	8 Credits	1200 Hours
CTSO	SkillsUSA-VICA	SkillsUSA-VICA
Co-op Method	Yes	Yes
Apprenticeship	Yes	Yes
Certification	GASENG RPR @7G	GASENG RPR @7G

Basic Skills
Math 8
Language 8
Reading 8

I. **PURPOSE:** The purpose of this program is to prepare students for employment or advanced training in the gasoline engine service technology industry and for a career as a small gas engine mechanic (DOT 620.281-034).

This program focuses on broad, transferable skills, stresses the understanding of all aspects of the gasoline engine services technology industry, and demonstrates such elements of the industry as planning, management, finance, technical and product skills, underlying principles of technology, labor issues, community issues, and health, safety, and environmental issues.

II. **PROGRAM STRUCTURE**: This program is a planned sequence of instruction consisting of five occupational completion points as follows: (1) Assembler (Setup), (Industry Title); (2) Clerk, Parts

(Industry Title); (3) Installer and Repairer (OES 85000); (4) Helper, Mechanic and Repairer (OES 98102); (5) Small Gas Engine Mechanic (DOT 620.281-034). When the recommended sequence is followed, the structure will allow students to complete specified portions of the program for employment or to remain for advanced training. A student who completes the applicable competencies at any occupational completion point may either continue with the training or become an occupational completer.

Occupational Completion Points may be reached before the end of a secondary course. All outcomes must be completed to receive credit for a Occupational Completion Point (OCP). Listed below are the courses that comprise this program when offered at the secondary level.

Listed below are the courses that comprise this program when offered at the Secondary Level:

8766010 - Gasoline Engine Service 1 (150) [100] OCP A
8766020 - Gasoline Engine Service 2 (150) [100] OCP B
8766030 - Gasoline Engine Service 3 (150) [200] OCP C
8766040 - Gasoline Engine Service 4 (150) [150] OCP D
8766050 - Gasoline Engine Service 5 (150)
8766060 - Gasoline Engine Service 6 (150)
8766070 - Gasoline Engine Service 7 (150)
8766080 - Gasoline Engine Service 8 (150) [650] OCP E

III. **LABORATORY ACTIVITIES:** Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry.

IV. **SPECIAL NOTE: SkillsUSA**-VICA, Inc. is the appropriate Career and Technical Student Organization (CTSO) for providing leadership training and for reinforcing specific career and technical skills. Career and Technical Student Organizations, when provided, shall be an integral part of the career and technical instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, FAC.

Cooperative training - OJT is appropriate for this program. Whenever cooperative training - OJT is offered, the following are required for each student: a training plan, signed by the student, teacher, and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; a workstation that reflects equipment, skills and tasks that are relevant to the occupation which the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's Individual Education Plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEPs. The job title for which the student is being trained must be designated in the IEP.

In accordance with Rule 6A-10.040, FAC, the minimum basic-skills grade levels required for adult vocational students to complete this program are: Mathematics 8.0, Language 8.0, Reading 8.0. These grade-level numbers correspond to grade-equivalent scores obtained on one of the state-designated basic-skills examinations. If a student does not meet

the basic-skills level required for completion of the program, remediation should be provided concurrently through Vocational Preparatory Instruction (VPI). Please refer to the Rule for exemptions.

When a secondary student with a disability is enrolled in a vocational class with modifications to the curriculum framework, the particular outcomes and student performance standards which the student must master to earn credit must be specified on an individual basis. The job or jobs for which the student is being trained should be reflected in the student's desired postschool outcome statement on the Transition Individual Educational Plan (Transition IEP).

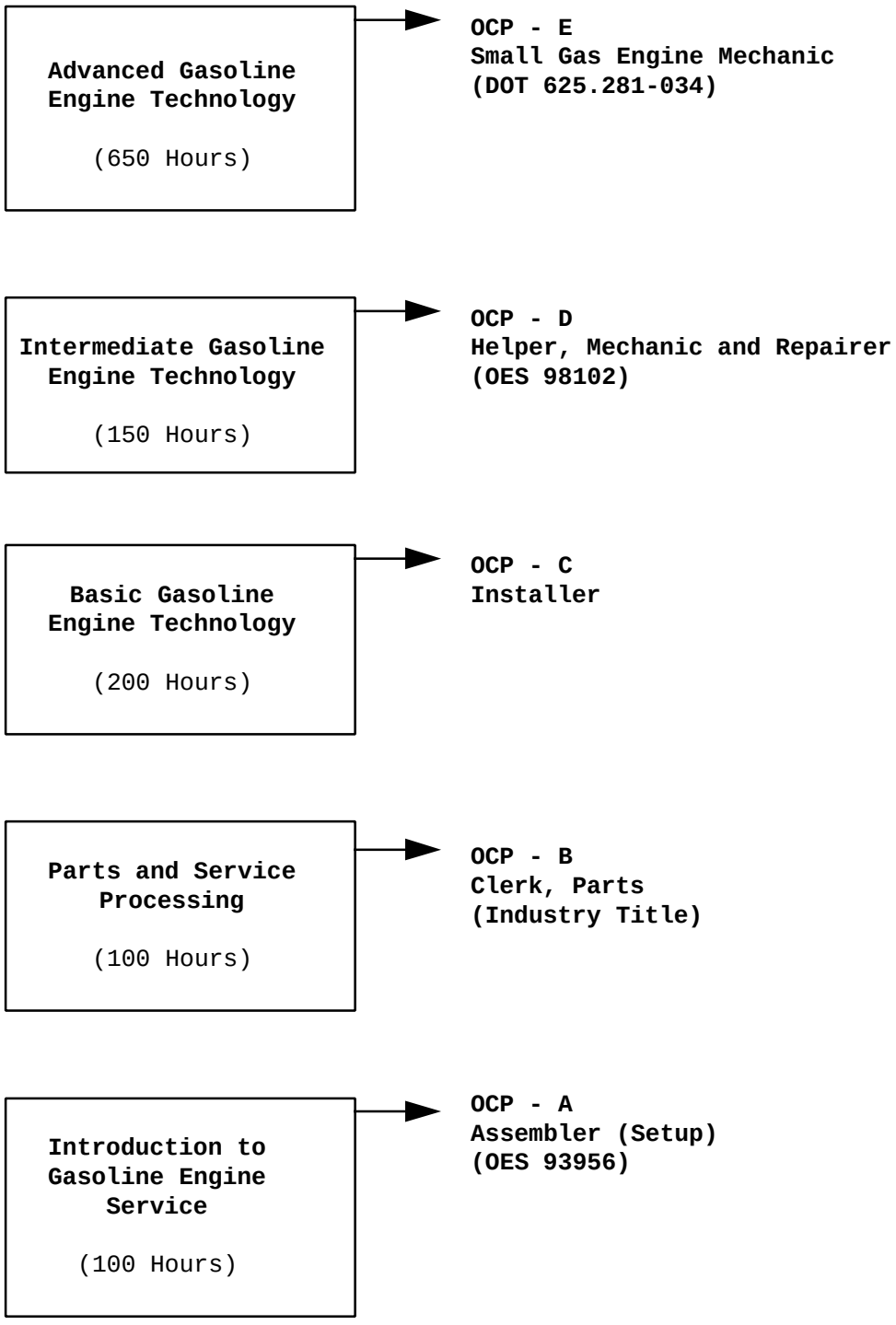
To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.
This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643, F.S.

V. **SCANS Competencies**: To accomplish the Secretary's Commission on Achieving Necessary Skills (SCANS) competencies, instructional strategies for this cluster must include methods that require students to identify, organize, and use resources appropriately; to work with each other cooperatively and productively; to acquire and use information; to understand social, organizational, and technological systems; and to work with a variety of tools and equipment. Instructional strategies must also incorporate methods to improve students' personal qualities and higher-order thinking skills.

The standard length of this program is 1200 hours.

The following diagram illustrates the program structure:

GASOLINE ENGINE SERVICE TECHNOLOGY



VI. **INTENDED OUTCOMES:** After successfully completing the program, the student will be able to:

OCCUPATIONAL COMPLETION POINT - DATA CODE - A (100 Hours)
ASSEMBLER (SETUP) OES 93956

01.0 Apply personal and industry safety requirements.
02.0 Demonstrate the proper use and care of basic shop tools and equipment.
03.0 Demonstrate appropriate set-up procedures.
04.0 Demonstrate basic math skills.
05.0 Demonstrate proficiency in performing pre-delivery maintenance services.
06.0 Demonstrate proficiency in employability skills and repair order processing.

OCCUPATIONAL COMPLETION POINT - DATA CODE - B (100 Hours)
CLERK, PARTS

07.0 Demonstrate industry-related communication skills.
08.0 Demonstrate industry-related math skills.
09.0 Demonstrate proficiency in acceptable employee behavior.
10.0 Demonstrate proficiency in parts inventory identification and repair order processing.

OCCUPATIONAL COMPLETION POINT - DATA CODE - C (200 Hours)
INSTALLER AND REPAIRER - OES 85000

11.0 Perform basic fuel system services.
12.0 Perform basic engine service and minor repairs.
13.0 Perform basic power transfer system and engine controls adjustments.

OCCUPATIONAL COMPLETION POINT - DATA CODE - D (150 Hours)
HELPER, MECHANIC AND REPAIRER - OES 98102

14.0 Perform power transfer system service.
15.0 Service and repair lubrication systems.
16.0 Perform basic electrical system service.
17.0 Service and repair cooling and exhaust systems.
18.0 Diagnose, repair and recondition basic engine components.
19.0 Apply industry-related science to small gas engine service.
20.0 Service and repair starting systems.
21.0 Perform basic tune-up service.

OCCUPATIONAL COMPLETION POINT - DATA CODE - E (650 Hours)
SMALL ENGINE MECHANIC - DOT 625.281-034
SMALL ENGINE SPECIALIST - OES 85328

22.0 Diagnose and repair ignition systems.
23.0 Service, repair and adjust engine controls.
24.0 Diagnose, service and repair electrical systems.
25.0 Demonstrate proficiency in repairing and maintaining basic two-stroke cycle engines.
26.0 Demonstrate proficiency in repairing and maintaining basic four-stroke cycle engines.
27.0 Demonstrate proficiency in repairing engine interior components.
28.0 Demonstrate proficiency in diagnosing and repairing power transfer systems.

29.0 Demonstrate applied communications skills.
30.0 Demonstrate proficiency in servicing, repairing and adjusting specific types of engines.
31.0 Demonstrate an understanding of entrepreneurship.

July 2001
Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Gasoline Engine Service Technology
Secondary Number: 8766000
Postsecondary Number: I470606

OCCUPATIONAL COMPLETION POINT - DATA CODE - A (100 Hours)
ASSEMBLER (SETUP) OES 93956

01.0 IDENTIFY PERSONAL AND INDUSTRY SAFETY REQUIREMENTS--The student will be able to:

- 01.01 Identify federal and state standards for health and safety, including OSHA and the Florida "Right-to-Know" law, Florida Statutes, Chapter 442.
- 01.02 Identify safety requirements for shop organization and management.
- 01.03 Identify safety requirements for the use of industry tools and equipment.
- 01.04 Identify fire-safety precautions.
- 01.05 Identify electrical-safety procedures.

02.0 DEMONSTRATE THE PROPER USE AND CARE OF BASIC SHOP TOOLS AND EQUIPMENT--The student will be able to:

- 02.01 Identify general and specialized hand tools.
- 02.02 Identify and use power tools.
- 02.03 Identify and use fasteners.

03.0 DEMONSTRATE APPROPRIATE SET-UP PROCEDURES--The student will be able to:

- 03.01 Identify and interpret manufacturer's identification number information.
- 03.02 Inspect tires; check and adjust air pressure.
- 03.03 Check for proper fluid levels.
- 03.04 Check accessory circuits.
- 03.05 Inspect and fill battery.
- 03.06 Detail engine and unit for delivery.
- 03.07 Install cables, hoses and electrical assemblies.
- 03.08 Inspect cables, connectors, clamps and hold-downs; adjust as necessary.
- 03.09 Check drive chain tension.

04.0 DEMONSTRATE BASIC MATH SKILLS--The student will be able to:

- 04.01 Add, subtract, multiply and divide using fractions, decimals and whole numbers.
- 04.02 Measure dimensions using millimeters and inches.

05.0 DEMONSTRATE PROFICIENCY IN PERFORMING PRE-DELIVERY MAINTENANCE SERVICES--The student will be able to:

- 05.01 Identify and describe typical gasoline engine lubricants and lubricant properties.
- 05.02 Perform battery state-of-charge test; perform slow/fast battery charge.

05.03 Inspect battery cables, connectors, clamps and hold-downs; adjust/tighten as needed.
05.04 Inspect fuses and replace as needed.
05.05 Check radiator coolant level (if applicable), test and add coolant.
05.06 Check fluid levels and change fluids and filters.

06.0 DEMONSTRATE PROFICIENCY IN EMPLOYABILITY SKILLS--The student will be able to:

06.01 Secure information about a job.
06.02 Identify documents that may be required when applying for a job.
06.03 Complete a job application form correctly.
06.04 Identify and adopt acceptable work habits.
06.05 Demonstrate acceptable employee health habits.
06.06 Demonstrate appropriate telephone/communication skills.
06.07 Conduct a job search.
06.08 Demonstrate competence in job interview techniques
06.09 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
06.10 Demonstrate knowledge of how to make appropriate job changes.

OCCUPATIONAL COMPLETION POINT - DATA CODE - B (100 Hours)
CLERK, PARTS

07.0 DEMONSTRATE INDUSTRY-RELATED COMMUNICATION SKILLS--The student will be able to:

07.01 Read and follow written and oral instructions.
07.02 Answer and ask questions coherently and concisely.
07.03 Write logical and understandable statements or phrases to accurately complete forms or invoices commonly used in business and industry.
07.04 Demonstrate appropriate telephone and face-to-face communication skills.
07.05 Read critically by recognizing assumptions and implications and by evaluating ideas.

08.0 DEMONSTRATE INDUSTRY-RELATED MATH SKILLS--The student will be able to:

08.01 Measure tolerance(s) millimeters and inches.
08.02 Perform metric to SAE (and SAE to metric) conversions.

09.0 DEMONSTRATE PROFICIENCY IN ACCEPTABLE EMPLOYEE BEHAVIOR-The student will be able to:

09.01 Explain the effects of chemical/substance abuse.
09.02 Identify principles of stress management.
09.03 Identify and define career opportunities in the industry.
09.04 Explain and identify acceptable work ethics.
09.05 Explain acceptable dress standards.
09.06 Identify and demonstrate proper customer relations skills.
09.07 Identify principles of time management.
09.08 Identify and define payroll deductions (taxes, insurance, social security) and employee benefits.

10.0 DEMONSTRATE PROFICIENCY IN PARTS INVENTORY IDENTIFICATION AND REPAIR ORDER PROCESSING--The student will be able to:

10.01 Read and interpret information in parts and service manuals and other technical media.
10.02 Read and understand graphs, charts, diagrams and tables commonly used in the industry.
10.03 Write and process work orders.
10.04 Prepare cost estimates for jobs using service- and flat-rate standards.
10.05 Perform basic parts inventory tracking.
10.06 Interpret and verify complaint; determine needed repairs.

OCCUPATIONAL COMPLETION POINT - DATA CODE - C (200 Hours)
INSTALLER AND REPAIRER - OES 85000

11.0 PERFORM BASIC FUEL SYSTEM SERVICE--The student will be able to:

11.01 Service air filters.
11.02 Service or replace fuel filters.
11.03 Determine and use correct fuel and fuel mixtures.

12.0 PERFORM BASIC ENGINE SERVICE AND MINOR REPAIRS--The student will be able to:

12.01 Identify types of engines.
12.02 Identify engine assemblies and systems.
12.03 Service crankcase breathers.
12.04 Identify types and ratios of two-cycle mix oils and their application to specific types of equipment.
12.05 Install spark plug(s).
12.06 Inspect and test fusible links, circuit breakers and fuses; replace as needed.

13.0 PERFORM BASIC POWER TRANSFER SYSTEM AND ENGINE CONTROLS ADJUSTMENTS--The student will be able to:

13.01 Inspect and measure drive belts and chains.
13.02 Install drive belts and chains.
13.03 Identify power transfer system components.
13.04 Sharpen and balance blades.
13.05 Remove and replace or install blades correctly.

OCCUPATIONAL COMPLETION POINT - DATA CODE - D (150 Hours)
HELPER, MECHANIC AND REPAIRER - OES 98102

14.0 PERFORM POWER TRANSFER SYSTEM SERVICE - The student will be able to:

14.01 Replace drive components.
14.02 Remove and repair clutches.

15.0 SERVICE AND REPAIR LUBRICATION SYSTEMS--The student will be able to:

15.01 Replace seals and gaskets.
15.02 Identify lubrication systems.
15.03 Service and repair lubrication systems.

16.0 PERFORM BASIC ELECTRICAL SYSTEM SERVICE--The student will be able to:

16.01 Identify ignition systems and components.
16.02 Perform basic electrical tests.
16.03 Replace electrical system components.
16.04 Identify and test batteries.
16.05 Service batteries according to manufacturer's specifications.

17.0 SERVICE AND REPAIR COOLING AND EXHAUST SYSTEMS--The student will be able to:

17.01 Service air cooling fins and screens.
17.02 Service two-cycle exhaust systems.
17.03 Service four-cycle exhaust systems.

18.0 REPAIR AND RECONDITION BASIC ENGINE COMPONENTS--The student will be able to:

18.01 Identify types of internal combustion engines.
18.02 Explain the basic principles of the operation of types of internal combustion engines.
18.03 Locate engine serial and model numbers.
18.04 Identify engine assemblies and systems.
18.05 Disassemble engines.
18.06 Clean and inspect heads for cracks, warpage and damaged spark plug threads.

19.0 APPLY INDUSTRY-RELATED SCIENCE TO SMALL GAS ENGINE SERVICE--The student will be able to:

19.01 Explain how temperature extremes, chemical reactions, and moisture content affect mechanical systems.
19.02 Draw conclusions or make inferences from data.
19.03 Identify health-related problems that may result from exposure to work-related chemicals and hazardous materials and know the proper precautions required for handling such materials.
19.04 Measure pressure in terms of pounds per square inch (PSI).

20.0 SERVICE AND REPAIR STARTING SYSTEMS--The student will be able to:

20.01 Service and repair manual starting systems.
20.02 Service and repair electrical starting systems.
20.03 Test and service battery starting systems.

21.0 PERFORM BASIC TUNE-UP SERVICE--The student will be able to:

21.01 Drain and refill oil, if applicable.
21.02 Identify spark plugs and special applications.
21.03 Remove, adjust and replace spark plugs.
21.04 Service filters and breathers.
21.05 Adjust ignition systems timing.
21.06 Inspect and service power transfer system.
21.07 Adjust valves.

OCCUPATIONAL COMPLETION POINT - DATA CODE - E (650 Hours)
SMALL ENGINE MECHANIC - DOT 625.281-034

22.0 DIAGNOSE AND REPAIR IGNITION SYSTEMS-The student will be able to:

22.01 Identify and diagnose ignition systems and components.
22.02 Repair magneto ignition systems.
22.03 Repair solid-state ignition systems.
22.04 Repair battery ignition systems.
22.05 Repair impulse ignition systems.
22.06 Diagnose magneto ignition systems.
22.07 Diagnose solid-state ignition systems.
22.08 Diagnose battery ignition systems.
22.09 Diagnose impulse ignition systems.

23.0 SERVICE, REPAIR AND ADJUST ENGINE CONTROLS--The student will be able to:

23.01 Service, repair and adjust governor speed controls.
23.02 Service, repair and adjust remote speed controls.
23.03 Service, repair and adjust manual start-stop controls.
23.04 Service, repair and adjust electrical start-stop controls.
23.05 Service, repair and adjust zone systems.
23.06 Service, repair and adjust blade clutch controls.
23.07 Service, repair and adjust chain brake systems.
23.08 Comply with the Consumer Protection Act (CPA) for three-second stops.
23.09 Comply with the CPA for interlocks.
23.10 Comply with the CPA for blade tip speed.
23.11 Read and interpret CPA rules and regulations.

24.0DIAGNOSE, SERVICE, REPAIR AND ADJUST ELECTRICAL SYSTEMS--The student will be able to:

24.01 Operate electrical testing instruments.
24.02 Perform electrical system tests.
24.03 Replace electrical system components.
24.04 Diagnose electrical system components.
24.05 Service, repair and adjust charging systems.

25.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC TWO-STROKE CYCLE ENGINES--The student will be able to:

25.01 Remove, clean and inspect piston rods and assemblies.
25.02 Measure out-of-round piston and cylinder.
25.03 Check the total bearing surface of connecting rod bearings.
25.04 Measure piston skirts and ring grooves.
25.05 Measure the piston ring gap in the cylinder bore.
25.06 Install piston pins according to manufacturer's specifications.
25.07 Check rod and piston assembly alignment.
25.08 Install rings on pistons.
25.09 Install piston rod assemblies.
25.10 Check needle bearings.
25.11 Inspect crankshafts and install seals.
25.12 Inspect, clean and/or replace reed valves.
25.13 Reassemble engines.

25.14 Diagnose head problems by use of the visual inspection method.
25.15 Diagnose head problems by use of the compression tester method.
25.16 Diagnose head problems by use of the cylinder air pressure method.
25.17 Measure and check crankshafts with a micrometer to diagnose engine problems.

26.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC FOUR-STROKE CYCLE ENGINES--The student will be able to:

26.01 Clean and inspect heads for cracks, warpage and damaged spark plug threads.
26.02 Inspect valves for warpage, burns, cracks, stem wear, tip wear and margin.
26.03 Grind valve seats and reface valves.
26.04 Check and inspect springs for free height, distortion and installed height.
26.05 Adjust valve lash.
26.06 Remove and inspect camshafts and lifters.
26.07 Measure camshafts.
26.08 Service camshaft bearings.
26.09 Clean and inspect lifters for wear.
26.10 Time valve drive assemblies.
26.11 Remove piston from rods assemblies.
26.12 Measure out-of-round and cylinder taper with a dial bore gage or micrometer.
26.13 Check piston pins and bosses for wear.
26.14 Measure piston ring lands width, out-of-round and taper.
26.15 Measure the piston ring gap in the cylinder bore.
26.16 Install and fit piston pins.
26.17 Check rod and piston assembly alignment.
26.18 Remove and replace rod bearings.
26.19 Hone and clean cylinders.
26.20 Install rings on pistons.
26.21 Measure and check crankshafts with a micrometer.
26.22 Check for end play.
26.23 Check the bearing bore with a telescoping gage using special tools provided by the engine manufacturer.
26.24 Reassemble engines.
26.25 Install oil seals.
26.26 Diagnose valve and head problems by use of the visual inspection method, i.e., water contamination vs. fuel-rich or lean carburetor adjustment.
26.27 Diagnose valve and head problems by use of the compression tester method.
26.28 Diagnose valve and head problems by use of the cylinder air pressure method.
26.29 Diagnose valve and head problems by use of the stethoscope method.

27.0 DEMONSTRATE PROFICIENCY IN REPAIRING ENGINE INTERIOR COMPONENTS--The student will be able to:

27.01 Service, repair and adjust valve systems.
27.02 Service, repair and adjust rings, bores and pistons.
27.03 Service, repair and adjust crankshafts and bearings.
27.04 Service, repair and adjust rods.
27.05 Service, repair and adjust lubrication systems.

27.06 Service, repair and adjust internal governor.
27.07 Service, repair and adjust internal components timing.
27.08 Assemble complete engines to manufacturer's specifications.
27.09 Diagnose causes of component failures to determine if they are due to friction, resulting from poor lubrication or contaminated fuel or to normal wear.

28.0 DEMONSTRATE PROFICIENCY IN DIAGNOSING AND REPAIRING POWER TRANSFER SYSTEMS--The student will be able to:

28.01 Repair manual transmissions.
28.02 Repair differentials.
28.03 Identify power transfer system components.
28.04 Replace drive components.
28.05 Remove and replace hydraulic pump systems.
28.06 Diagnose manual transmissions.
28.07 Diagnose differentials.
28.08 Diagnose drive components.

29.0 DEMONSTRATE APPLIED COMMUNICATION SKILLS--The student will be able to:

29.01 Draw and interpret electrical, electronic, hydraulic and mechanical schematics.
29.02 Write reports.
29.03 Maintain test logs.
29.04 Make equipment failure reports.
29.05 Specify and requisition components.
29.06 Compose technical letters
29.07 Write formal reports of laboratory experiences.

30.0 DEMONSTRATE PROFICIENCY IN SERVICING-- REPAIRING AND ADJUSTING SPECIFIC TYPES OF ENGINES--The student will be able to:

30.01 Service, repair and adjust lawn and garden equipment.
30.02 Service, repair and adjust commercial golf course equipment.
30.03 Service, repair and adjust commercial industrial equipment.

31.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

31.01 Define entrepreneurship.
31.02 Describe the importance of entrepreneurship to the American economy.
31.03 List the advantages and disadvantages of business ownership.
31.04 Identify the risks involved in ownership of a business.
31.05 Identify the necessary personal characteristics of a successful entrepreneur.
31.06 Identify the business skills needed to operate a small business efficiently and effectively.

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STUDENT PERFORMANCE STANDARDS

Course Title: Gasoline Engine Service Technology 1
Course Number: 8766010
Course Credit: 1

01.0 IDENTIFY PERSONAL AND INDUSTRY SAFETY REQUIREMENTS--The student will be able to:

- 01.01 Identify federal and state standards for health and safety, including OSHA and the Florida "Right-to-Know" law, Florida Statutes, Chapter 442.
- 01.02 Identify safety requirements for shop organization and management.
- 01.03 Identify safety requirements for the use of industry tools and equipment.
- 01.04 Identify fire-safety precautions.
- 01.05 Identify electrical-safety procedures.

02.0 DEMONSTRATE THE PROPER USE AND CARE OF BASIC SHOP TOOLS AND EQUIPMENT--The student will be able to:

- 02.01 Identify general and specialized hand tools.
- 02.02 Identify and use power tools.
- 02.03 Identify and use fasteners.

03.0 DEMONSTRATE APPROPRIATE SET-UP PROCEDURES--The student will be able to:

- 03.01 Identify and interpret manufacturer's identification number information.
- 03.02 Inspect tires; check and adjust air pressure.
- 03.03 Check for proper fluid levels.
- 03.04 Check accessory circuits.
- 03.05 Inspect and fill battery.
- 03.06 Detail engine and unit for delivery.
- 03.07 Install cables, hoses and electrical assemblies.
- 03.08 Inspect cables, connectors, clamps and hold-downs; adjust as necessary.
- 03.09 Check drive chain tension.

04.0 DEMONSTRATE BASIC MATH SKILLS--The student will be able to:

- 04.01 Add, subtract, multiply and divide using fractions, decimals and whole numbers.
- 04.02 Measure dimensions using millimeters and inches.

05.0 DEMONSTRATE PROFICIENCY IN PERFORMING PRE-DELIVERY MAINTENANCE SERVICES--The student will be able to:

- 05.01 Identify and describe typical gasoline engine lubricants and lubricant properties.
- 05.02 Perform battery state-of-charge test; perform slow/fast battery charge.
- 05.03 Inspect battery cables, connectors, clamps and hold-downs; adjust/tighten as needed.
- 05.04 Inspect fuses and replace as needed.

05.05 Check radiator coolant level (if applicable), test and add coolant.
05.06 Check fluid levels and change fluids and filters.

06.0 DEMONSTRATE PROFICIENCY IN EMPLOYABILITY SKILLS--The student will be able to:

06.01 Secure information about a job.
06.02 Identify documents that may be required when applying for a job.
06.03 Complete a job application form correctly.
06.04 Identify and adopt acceptable work habits.
06.05 Demonstrate acceptable employee health habits.
06.06 Demonstrate appropriate telephone/communication skills.
06.07 Conduct a job search.
06.08 Demonstrate competence in job interview techniques
06.09 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
06.10 Demonstrate knowledge of how to make appropriate job changes.

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STUDENT PERFORMANCE STANDARDS

Course Title: Gasoline Engine Service Technology 2
Course Number: 8766020
Course Credit: 1

07.0 DEMONSTRATE INDUSTRY-RELATED COMMUNICATION SKILLS--The student will be able to:

- 07.01 Read and follow written and oral instructions.
- 07.02 Answer and ask questions coherently and concisely.
- 07.03 Write logical and understandable statements or phrases to accurately complete forms or invoices commonly used in business and industry.
- 07.04 Demonstrate appropriate telephone and face-to-face communication skills.
- 07.05 Read critically by recognizing assumptions and implications and by evaluating ideas.

08.0 DEMONSTRATE INDUSTRY-RELATED MATH SKILLS--The student will be able to:

- 08.01 Measure tolerance(s) millimeters and inches.
- 08.02 Perform metric to SAE (and SAE to metric) conversions.

09.0 DEMONSTRATE PROFICIENCY IN ACCEPTABLE EMPLOYEE BEHAVIOR--The student will be able to:

- 09.01 Explain the effects of chemical/substance abuse.
- 09.02 Identify principles of stress management.
- 09.03 Identify and define career opportunities in the industry.
- 09.04 Explain and identify acceptable work ethics.
- 09.05 Explain acceptable dress standards.
- 09.06 Identify and demonstrate proper customer relations skills.
- 09.07 Identify principles of time management.
- 09.08 Identify and define payroll deductions (taxes, insurance, social security) and employee benefits.

10.0 DEMONSTRATE PROFICIENCY IN PARTS INVENTORY IDENTIFICATION AND REPAIR ORDER PROCESSING--The student will be able to:

- 10.01 Read and interpret information in parts and service manuals and other technical media.
- 10.02 Read and understand graphs, charts, diagrams and tables commonly used in the industry.
- 10.03 Write and process work orders.
- 10.04 Prepare cost estimates for jobs using service- and flat-rate standards.
- 10.05 Perform basic parts inventory tracking.
- 10.06 Interpret and verify complaint; determine needed repairs.

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STUDENT PERFORMANCE STANDARDS

Course Title: Gasoline Engine Service Technology 3
Course Number: 8766030
Course Credit: 1

11.0 PERFORM BASIC FUEL SYSTEM SERVICE--The student will be able to:

11.01 Service air filters.
11.02 Service or replace fuel filters.
11.03 Determine and use correct fuel and fuel mixtures.

12.0 PERFORM BASIC ENGINE SERVICE AND MINOR REPAIRS--The student will be able to:

12.01 Identify types of engines.
12.02 Identify engine assemblies and systems.
12.03 Service crankcase breathers.
12.04 Identify types and ratios of two-cycle mix oils and their application to specific types of equipment.
12.05 Install spark plug(s).
12.06 Inspect and test fusible links, circuit breakers and fuses; replace as needed.

13.0 PERFORM BASIC POWER TRANSFER SYSTEM AND ENGINE CONTROLS ADJUSTMENTS--The student will be able to:

13.01 Inspect and measure drive belts and chains.
13.02 Install drive belts and chains.
13.03 Identify power transfer system components.
13.04 Sharpen and balance blades.
13.05 Remove and replace or install blades correctly.

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STUDENT PERFORMANCE STANDARDS

Course Title: Gasoline Engine Service Technology 4
Course Number: 8766040
Course Credit: 1

14.0 PERFORM POWER TRANSFER SYSTEM SERVICE--The student will be able to:

- 14.01 Replace drive components.
- 14.02 Remove and repair clutches.

15.0 SERVICE AND REPAIR LUBRICATION SYSTEMS--The student will be able to:

- 15.01 Replace seals and gaskets.
- 15.02 Identify lubrication systems.
- 15.03 Service and repair lubrication systems.

16.0 PERFORM BASIC ELECTRICAL SYSTEM SERVICE--The student will be able to:

- 16.01 Identify ignition systems and components.
- 16.02 Perform basic electrical tests.
- 16.03 Replace electrical system components.
- 16.04 Identify and test batteries.
- 16.05 Service batteries according to manufacturer's specifications.

17.0 SERVICE AND REPAIR COOLING AND EXHAUST SYSTEMS--The student will be able to:

- 17.01 Service air cooling fins and screens.
- 17.02 Service two-cycle exhaust systems.
- 17.03 Service four-cycle exhaust systems.

18.0 REPAIR AND RECONDITION BASIC ENGINE COMPONENTS--The student will be able to:

- 18.01 Identify types of internal combustion engines.
- 18.02 Explain the basic principles of the operation of types of internal combustion engines.
- 18.03 Locate engine serial and model numbers.
- 18.04 Identify engine assemblies and systems.
- 18.05 Disassemble engines.
- 18.06 Clean and inspect heads for cracks, warpage and damaged spark plug threads.

19.0 APPLY INDUSTRY-RELATED SCIENCE TO SMALL GAS ENGINE SERVICE--The student will be able to:

- 19.01 Explain how temperature extremes, chemical reactions, and moisture content affect mechanical systems.
- 19.02 Draw conclusions or make inferences from data.
- 19.03 Identify health-related problems that may result from exposure to work-related chemicals and hazardous materials and know the proper precautions required for handling such materials.

19.04 Measure pressure in terms of pounds per square inch (PSI).

20.0 SERVICE AND REPAIR STARTING SYSTEMS--The student will be able to:

20.01 Service and repair manual starting systems.
20.02 Service and repair electrical starting systems.
20.03 Test and service battery starting systems.

21.0 PERFORM BASIC TUNE-UP SERVICE--The student will be able to:

21.01 Drain and refill oil, if applicable.
21.02 Identify spark plugs and special applications.
21.03 Remove, adjust and replace spark plugs.
21.04 Service filters and breathers.
21.05 Adjust ignition systems timing.
21.06 Inspect and service power transfer system.
21.07 Adjust valves.

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Course Credit: 1

22.0 DIAGNOSE AND REPAIR IGNITION SYSTEMS--The student will be able to:

22.01 Identify and diagnose ignition systems and components.
22.02 Repair magneto ignition systems.
22.03 Repair solid-state ignition systems.
22.04 Repair battery ignition systems.
22.05 Repair impulse ignition systems.
22.06 Diagnose magneto ignition systems.
22.07 Diagnose solid-state ignition systems.
22.08 Diagnose battery ignition systems.
22.09 Diagnose impulse ignition systems.

23.0 SERVICE, REPAIR AND ADJUST ENGINE CONTROLS--The student will be able to:

23.01 Service, repair and adjust governor speed controls.
23.02 Service, repair and adjust remote speed controls.
23.03 Service, repair and adjust manual start-stop controls.
23.04 Service, repair and adjust electrical start-stop controls.
23.05 Service, repair and adjust zone systems.
23.06 Service, repair and adjust blade clutch controls.
23.07 Service, repair and adjust chain brake systems.
23.08 Comply with the Consumer Protection Act (CPA) for three-second stops.
23.09 Comply with the CPA for interlocks.
23.10 Comply with the CPA for blade tip speed.
23.11 Read and interpret CPA rules and regulations.

24.0 DIAGNOSE, SERVICE, REPAIR AND ADJUST ELECTRICAL SYSTEMS--The student will be able to:

24.01 Operate electrical testing instruments.
24.02 Perform electrical system tests.
24.03 Replace electrical system components.
24.04 Diagnose electrical system components.
24.05 Service, repair and adjust charging systems.

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Course Title: Gasoline Engine Service Technology 6
Course Number: 8766060
Course Credit: 1

25.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC TWO-STROKE CYCLE ENGINES--The student will be able to:

25.01 Remove, clean and inspect piston rods and assemblies.
25.02 Measure out-of-round piston and cylinder.
25.03 Check the total bearing surface of connecting rod bearings.
25.04 Measure piston skirts and ring grooves.
25.05 Measure the piston ring gap in the cylinder bore.
25.06 Install piston pins according to manufacturer's specifications.
25.07 Check rod and piston assembly alignment.
25.08 Install rings on pistons.
25.09 Install piston rod assemblies.
25.10 Check needle bearings.
25.11 Inspect crankshafts and install seals.
25.12 Inspect, clean and/or replace reed valves.
25.13 Reassemble engines.
25.14 Diagnose head problems by use of the visual inspection method.
25.15 Diagnose head problems by use of the compression tester method.
25.16 Diagnose head problems by use of the cylinder air pressure method.
25.17 Measure and check crankshafts with a micrometer to diagnose engine problems.

26.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC FOUR-STROKE CYCLE ENGINES--The student will be able to:

26.01 Clean and inspect heads for cracks, warpage and damaged spark plug threads.
26.02 Inspect valves for warpage, burns, cracks, stem wear, tip wear and margin.
26.03 Grind valve seats and reface valves.
26.04 Check and inspect springs for free height, distortion and installed height.
26.05 Adjust valve lash.
26.06 Remove and inspect camshafts and lifters.
26.07 Measure camshafts.
26.08 Service camshaft bearings.
26.09 Clean and inspect lifters for wear.
26.10 Time valve drive assemblies.
26.11 Remove piston from rods assemblies.
26.12 Measure out-of-round and cylinder taper with a dial bore gage or micrometer.
26.13 Check piston pins and bosses for wear.
26.14 Measure piston ring lands width, out-of-round and taper.
26.15 Measure the piston ring gap in the cylinder bore.
26.16 Install and fit piston pins.
26.17 Check rod and piston assembly alignment.
26.18 Remove and replace rod bearings.

26.19 Hone and clean cylinders.
26.20 Install rings on pistons.
26.21 Measure and check crankshafts with a micrometer.
26.22 Check for end play.
26.23 Check the bearing bore with a telescoping gage using special tools provided by the engine manufacturer.
26.24 Reassemble engines.
26.25 Install oil seals.
26.26 Diagnose valve and head problems by use of the visual inspection method, i.e., water contamination vs. fuel-rich or lean carburetor adjustment.
26.27 Diagnose valve and head problems by use of the compression tester method.
26.28 Diagnose valve and head problems by use of the cylinder air pressure method.
26.29 Diagnose valve and head problems by use of the stethoscope method.

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Course Title: Gasoline Engine Service Technology 7
Course Number: 8766070
Course Credit: 1

27.0 DEMONSTRATE PROFICIENCY IN REPAIRING ENGINE INTERIOR COMPONENTS--The student will be able to:

27.01 Service, repair and adjust valve systems.
27.02 Service, repair and adjust rings, bores and pistons.
27.03 Service, repair and adjust crankshafts and bearings.
27.04 Service, repair and adjust rods.
27.05 Service, repair and adjust lubrication systems.
27.06 Service, repair and adjust internal governor.
27.07 Service, repair and adjust internal components timing.
27.08 Assemble complete engines to manufacturer's specifications.
27.09 Diagnose causes of component failures to determine if they are due to friction, resulting from poor lubrication or contaminated fuel or to normal wear.

28.0 DEMONSTRATE PROFICIENCY IN DIAGNOSING AND REPAIRING POWER TRANSFER SYSTEMS--The student will be able to:

28.01 Repair manual transmissions.
28.02 Repair differentials.
28.03 Identify power transfer system components.
28.04 Replace drive components.
28.05 Remove and replace hydraulic pump systems.
28.06 Diagnose manual transmissions.
28.07 Diagnose differentials.
28.08 Diagnose drive components.

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STUDENT PERFORMANCE STANDARDS

Course Title: Gasoline Engine Service Technology 8
Course Number: 8766080
Course Credit: 1

29.0 DEMONSTRATE APPLIED COMMUNICATION SKILLS--The student will be able to:

29.01 Draw and interpret electrical, electronic, hydraulic and mechanical schematics.
29.02 Write reports.
29.03 Maintain test logs.
29.04 Make equipment failure reports.
29.05 Specify and requisition components.
29.06 Compose technical letters
29.07 Write formal reports of laboratory experiences.

30.0 DEMONSTRATE PROFICIENCY IN SERVICING REPAIRING AND ADJUSTING SPECIFIC TYPES OF ENGINES--The student will be able to:

30.01 Service, repair and adjust lawn and garden equipment.
30.02 Service, repair and adjust commercial golf course equipment.
30.03 Service, repair and adjust commercial industrial equipment.

31.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

31.01 Define entrepreneurship.
31.02 Describe the importance of entrepreneurship to the American economy.
31.03 List the advantages and disadvantages of business ownership.
31.04 Identify the risks involved in ownership of a business.
31.05 Identify the necessary personal characteristics of a successful entrepreneur.
31.06 Identify the business skills needed to operate a small business efficiently and effectively.