

**WARREN COUNTY SCHOOL DISTRICT**  
**PLANNED INSTRUCTION**

**COURSE DESCRIPTION**

**Course Title:** Power Equipment Technology (Vehicle Maintenance Technology, Other)

**CIP #** 47.0699

**Course Number:** 00909 (AM); 00959 (PM)

**Course Prerequisites:** N/A

**Special Requirements:** Mechanical aptitude, manipulative dexterity, and a good work ethic are important for success in this field.

**Course Description:**

The Power Equipment Technology prepares individuals to apply technical knowledge and skills to service, repair, maintain and diagnose problems on a variety of internal – combustion engines and related systems. This entails many types and forms of recreational, commercial, oil and gas extraction equipment, and agriculture equipment. Motorcycles, watercraft, snowmobiles, All Terrain Vehicles , chainsaws, lawn and garden equipment, tractors, pumps, generator and portable power stations. This program provides instruction in the principles of internal combustion engines and many systems related to the power unit. Instruction also includes the use of technical materials and software, use and care of tools and test equipment, engine tune-up/maintenance, engine overhaul, troubleshooting and diagnostic techniques, drive lines and propulsion systems, electrical and electronic systems, suspension and steering systems and service operations, parts management, and safety.

**Suggested Grade Level:** 10 -12

**Length of Course:** One Semester Two Semesters 3 Years (Other) The first year is a common core and the second and third year will involve the specialty areas of study.

**Units of Credit:** 3 per year (Insert NONE if appropriate.)

**PDE Certification and Staffing Policies and Guidelines (CSPG) Required Teacher Certification(s)** (Insert certificate title and CSPG#) Vocational Certification II in Small Engine Repair

**Certification verified by WCSD Human Resources Department:**

X  Yes        No

## **Board Approved Textbooks, Software, and Materials:**

**Book Title: Small Gas Engines**

**Publisher: The Goodheart-Willcox Company**

**ISBN #: 1-59070-183-6**

**Copyright: 2003**

**Book Title: Motorcycles Fundamentals, Service, Repair**

**Publisher: The Goodheart-Willcox Company**

**ISBN#: 1-56637-4-479-0**

**Copyright: 1999**

**Book Title: Small Engine**

**Publisher: American Technical Publishers Inc.**

**ISBN: 0-8269-0008-9**

**Copyright: 2002**

**Petex E-Learning System**

## **BOARD APPROVAL:**

**Date Written:** February 2011

**Date Approved:** December 5, 2011

**Implementation Year:** 2011-2012

## **Suggested Supplemental Materials:**

- **ThePowerPortal Program from Briggs and Stratton**
- **OHV program from Briggs and Stratton**
- **Generator programs from Briggs and Stratton**
- **SP-2 Safety Program**
- **Yamaha 5 Star Program**
- **Q-care E-ssentials Program B.R.P.**
- **Mercury University E-Skills**
- **Amtech**
- **ATP Small Engine Resource Guide**
- **MAVCC Curriculum**
- **Petex Individual E-Learning**

## **Course Standards**

**PA Academic Standards:** (See attached state framework with course strands with accompanying standards)

Career Education and Work: 13.1.11D, 13.2.11B, D, F, and G, 13.3.11A

Science and Technology: 3.1.10C, 3.2.10A, 3.2.12B, 3.4.10A-S, 3.7.10A-D, 3.7.12.A & D, 3.8.12B,

Math: 2.3.11A-C, 2.4.11A & B, 2.5.11C, 2.5.11D, 2.7.11E

Reading, Writing, Speaking, and Listening: 1.2.11A & B, 1.11.1G-R

**WCSD Academic Standards:**

None

**Industry or Other Standards:**

(See included state framework with course strands with accompanying standards.)

**SPECIAL EDUCATION AND GIFTED REQUIREMENTS**

The teacher shall make appropriate modifications to instruction and assessment based on a student’s Individual Education Plan (IEP) or Gifted Individual Education Plan (GIEP).

**Program of Study/CIP competencies  
Integrated in the Standards**

**ASSESSMENTS**

**PSSA Assessment Anchors Addressed:** The teacher must be knowledgeable of the PDE Assessment Anchors and/or Eligible Content and incorporate them into this planned instruction. Current assessment anchors can be found at [pde@state.pa.us](http://pde@state.pa.us).

(The teacher will develop and use standards-based assessments throughout the course.)

**Formative Assessments:**

- Performance Lab check sheets
- Quizzes
- Written Tests
- Teacher monitoring and assessment of hands-on-activities
- On-line testing via O.E.M. testing websites

**Summative Assessments:**

- Teacher monitoring of student work and performance evaluation checklist and/or competency check list.
- N.O.C.T.I. Test is given to program completers
- Equipment and Training Council O.P.E. test
- And, other on-line O.E.M. tests (Power Portal system, etc.)

**Portfolio Assessment:**       Yes       No

**District-wide Final Examination Required:**       Yes       No

**Course Challenge Assessment:** N/A

## REQUIRED COURSE SEQUENCE AND TIMELINE

(Content must be tied to objectives)

Content Sequence

Dates

(See attached state framework with course strands with accompanying time frame allotments.)

### Objectives:

#### The student will be able to:

Service, maintain, repair and diagnose a variety of 2-cycle and 4-cycle engines and related systems associated with recreational, commercial, and oil and gas extraction industries.

**WRITING TEAM:** James Mechling, Power Equipment Technology Occupational Advisory Committee, Academic Coaching Team and Daniel K. Passmore

### WCSD STUDENT DATA SYSTEM INFORMATION

1. Is there a required final examination?       Yes       No
2. Does this course issue a mark/grade for the report card?       Yes       No
3. Does this course issue a Pass/Fail mark?       Yes       No
4. Is the course mark/grade part of the GPA calculation?       Yes       No
5. Is the course eligible for Honor Roll calculation?       Yes       No
6. What is the academic weight of the course?  
 No weight/Non credit       Standard weight  
 Enhanced weight (Describe)

## Program of Study/CIP competencies Integrated in the Standards

		Career Standards *	Science & Technology	Math	Reading	Common Core Standards	Industry Standards	Industry Certifications	Timeline
100	<b>FOLLOW SAFETY RULES AND REGULATIONS.</b>	*	3.2.10A 3.7.12D	2.4.11A	1.2.11A	W-1 R-1,4,8 M-NQ	✓	✓	1 & 2
	<ul style="list-style-type: none"> <li>Demonstrate knowledge by passing the SP/2 test</li> </ul>					W-1 R-1,4,8 M-NQ	✓		
200	<b>DEMONSTRATE KNOWLEDGE OF THE PRINCIPLES AND DESIGN OF 2-CYCLE AND 4-CYCLE ENGINES</b>	*	3.7.10A 3.7.12D	2.3.11A & B	1.2.11A	W-1 R-1,4,8 M-NQ	✓	✓	1
300	<b>DEMONSTRATE KNOWLEDGE OF LUBRICATION SYSTEMS.</b>	*	3.7.10B 3.7.12D	2.3.11A	1.2.11A	W-1 R-1,4,8 M-NQ	✓	✓	2 & 3
400	<b>DEMONSTRATE KNOWLEDGE OF BASIC ELECTRICITY.</b>	*	3.4.10B 3.7.12D	2.3.11C	1.2.11A	W-1 R-1,4,8 M-NQ	✓	✓	1
500	<b>TROUBLESHOOT AC ELECTRIC MOTORS AND CONTROLERS/TIMERS/STRINING</b>	*	3.7.10B 3.7.12D	2.3.11A	1.2.11A & B	W-1 R-1,4,8 M-NQ	✓	✓	2 & 3
600	<b>DEMONSTRATE KNOWLEDGE OF FUEL SYSTEMS, NATURAL GAS, PROPANE AND GASOLINE</b>	*	3.4.10 A & C 3.7.12 D	2.5.11C	1.2.11A	W-1 R-1,4,8 M-NQ	✓	✓	1



		Career Standards*	Science & Technology	Math	Reading	Common Core Standards	Industry Standards	Industry Certifications	Timeline
1600	OVERHAUL A 4-CYCLE GASOLINE ENGINE.	*	3.4.10 B 3.8.12 B	2.3.11C	1.2.11A	W-1 R-1,4,8 M- NQF- IF,S-ID	✓	✓	2 & 3
1700	OVERHAUL A 2-CYCLE ENGINE.	*	3.4.10 B 3.8.12 B	2.3.11C	1.2.11A	W-1 R-1,4,8 M- NQ,F- IF,S-ID	✓	✓	2 & 3
1800	CONDUCT A FAILURE ANALYSIS ON GASOLINE ENGINES.	*	3.4.10 A-C 3.8.12 B 3.7.12 D	2.3.11A-C	1.2.11A& B	W-1 R-1,4,8 M- NQ,F- IF	✓	✓	2 & 3
1800	CONDUCT A FAILURE ANALYSIS ON GASOLINE ENGINES.	*	3.4.10 A-C 3.8.12 B 3.7.12 D	2.3.11A-C	1.2.11A& B	W-1 R-1,4,8 M- NQ,F- IF	✓	✓	2 & 3
1900	SERVICE MANUAL STARTING SYSTEMS.	*	3.1.10 C 3.8.12 B	2.1.11E	1.2.11A	W-1 R-1,4,8 M-NQ	✓	✓	1
2000	SERVICE ELECTRICAL STARTING SYSTEMS.	*	3.7.10 B 3.8.12 B	2.5.11D	1.2.11A	W-1 R-1,4,8 M-NQ	✓	✓	2 & 3
2100	SERVICE AND TEST CHARGING SYSTEMS.	*	3.7.10B 3.8.12 B	2.5.11D	1.2.11A	W-1 R-1,4,8 M-NQ	✓	✓	2 & 3
2200	SERVICE AND LUBRICATION SYSTEMS.	*	3.7.10 B 3.8.12 B	2.3.11A	1.2.11A	W-1 R-1,4,8 M-NQ	✓	✓	2 & 3
2300	IDENTIFY AND SERVICE GOVERNORS.	*	3.7.10 A 3.8.12 B 3.7.12 D	2.5.8C	1.2.11A	W-1 R-1,4,8 M-NQ	✓	✓	1

		Career Standards*	Science & Technology	Math	Reading	Common Core Standards	Industry Standards	Industry Certifications	Timeline
2400	SERVICE BREAKING SYSTEMS.	*	3.7.10 A 3.8.12 B	1.5.11A	1.2.11A	W-1 R-1,4,8 M-NQ	✓	✓	2 & 3
2500	SERVICE CLUTCHES AND EQUIPMENT DRIVES.	*	3.7.10 A & B 3.8.12 B	2.5.8C	1.2.11A	W-1 R-1,4,8 M-NQ	✓	✓	2 & 3
2600	SERVICE TRANSMISSIONS, TRANS-AXLES, AND HYDROSTATIC DRIVES.	*	3.7.10 A 3.8.12 B	1.5.11A	1.2.11A	W-1 R-1,4,8 M-NQ	✓	✓	2 & 3
2700	REPAIR AND OVERHAUL TRANSMISSIONS AND DRIVES.	*	3.7.10 A 3.8.12 B	2.3.11A	1.2.11A	W-1 R-1,4,8 M-NQ	✓	✓	2 & 3
2800	ORDER AND REPAIR PARTS AND KEEP RECORDS.	*	3.7.10 C & D	2.7.11E 2.2.11A	1.2.11A 1.6.11A	W-1 R-1,4,8 M-NQ	✓	✓	2 & 3
2900	TRAILERS.		3.7.10 A 3.8.12 B	3.8.12B	1.2.11A	W-1 R-1,4,8 M-NQ	✓	✓	2 & 3
3000	CHAINSAW		3.7.10 A 3.8.12 B	2.5.11A	1.2.11A	W-1 R-1,4,8 M-NQ	✓	✓	2 & 3
3001	History/Geology & Exploration of Oil & Gas Production		3.7.10 A 3.7.12 D	2.3.11A & B	1.2.11A	W-1 R-1,4,8 M-NQ			2
3002	Practice safe ATV operation and service		3.2.10 A 3.7.12 D	2.4.11A	1.2.11A	W-1 R-1,4,8 M-NQ			2



		Career Standards*	Science & Technology	Math	Reading	Common Core Standards	Industry Standards	Industry Certifications	Timeline
3003	Practice safety in the Industry environmental rules and best practices and safety certifications		3.2.10 A 3.7.12 D	2.4.11A	1.2.11A	W-1 R-1,4,8 M-NQ			2
3004	Demonstrate usage and knowledge in Natural Gas regulators, relieve valves and back pressure regulators		3.7.10 A 3.8.12 B	1.5.11A	1.2.11A	W-1 R-1,4,8 M-NQ			2
3005	Understand Oil & Gas 2 phase separators and tanks		3.7.10 A 3.8.12 B	1.5.11A	1.2.11A	W-1 R-1,4,8 M-NQ			2
3006	Explain Duties & responsibilities of well tender		3.4.10 A & C 3.8.12 B 3.7.12 D	2.5.11C	1.2.11A	W-1 R-1,4,8 M-NQ			2 & 3
3007	Understand and perform Service rig operations/ draw works		3.4.10 B 3.8.12 B	2.3.11C	1.2.11A	W-1 R-1,4,8 M- NQF- IF,S-ID			3
3008	Demonstrate Proper use of combustibles gas indicator/ buried pipe locating equipment		3.710B 3.8.12 B	2.5.11D	1.2.11A	W-1 R-1,4,8 M-NQ			3
3009	Perform Seasonal service maintenance		3.4.10 B 3.8.12 B	2.3.11C	1.2.11A	W-1 R-1,4,8 M- NQF- IF,S-ID			3
3010	Demonstrate knowledge of Oil & Gas reservoir designs/storage		3.4.10 B 3.8.12 B	2.3.11C	1.2.11A	W-1 R-1,4,8 M- NQF- IF,S-ID			3
3011	Understand Oil well production techniques ( local )		3.7.10 A 3.8.12 B	1.5.11A	1.2.11A	W-1 R-1,4,8 M-NQ			3



**\*Career Standards to be addressed for entire program include: 13.1, 13.2, 13.3 and 13.4 and can be found within the Planned Instruction.**

**These competencies are under constant review with the Occupational Advisory Committee's input and are subject to change with industry standards and objectives.**