

SMALL ENGINES

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COURSE DESCRIPTION

This one semester course allows students to explore the possibilities of small engines, their usefulness, maintenance, and repair. Small engine repair is a fast growing career opportunity.

STANDARDS AND BENCHMARKS

Class standards and benchmarks align with the ITEA standards and benchmarks.

WHAT ARE WE GOING TO DO IN THIS CLASS?

COURSE OBJECTIVES

Upon completion of this course, the student will be able to:

1. List Manufactures, models and types of small engines.
2. List and explain the engine systems.
3. Identify engine components and location on engine.
4. Identify common tools that are used in small engine service and repair.
5. Make educated decisions on which power tools to purchase.
6. Check fluids, repair damaged parts, change oil.
7. Disassemble and reassemble a small engine.
8. Assess electric, charging, and starting components.
9. Diagnostic and troubleshooting techniques.
10. Have the capability of working in a repair facility.

Class Calendar: (approximate timeframes)

Unit 1- Engine Operation (2 weeks)

- Engine Component Identification
- 4 Stroke Engine Operation
- Engine Classifications and Power
- Engine Applied Physics

Unit 2- Safety, Tools, and Fasteners (2 weeks)

- Equipment Training
- General Shop Safety
- Equipment& Tool Location
- Tool Identification
- Fastener Identification

Unit 3- Compression System (2 weeks)

- Valve Train Components
- Pistons, Rings, & Cylinders
- Gaskets & Seals

Unit 4- Fuel System (2 weeks)

- Fuel Properties
- Fuel System Components
- Carburetors

Unit 5- Governor System (2 weeks)

- Pneumatic Governors
- Mechanical Governors
- Electrical Governors

Unit 6- Electrical System (2 weeks)

- Electrical Theory
- Ignition System Components
- Batteries, Starters, and Alternators

Unit 7- Cooling and Lubrication System (2 weeks)

- Cooling System Components
- Cooling System Operation
- Lubrication System Components
- Lubrication System Operation

Unit 8- Maintenance, Diagnostics, & Troubleshooting (2 weeks)

- Maintenance Service Intervals
- Diagnostic Flow Charts
- Problem Solving

Unit 9- Alternate Small Engine Technology (1 week)

- 2 Strokes
- Diesel Engines
- Propane Engines
- Electric Motors

Unit 10- Career Exploration (1 week)

- Investigate Careers Related to Engine Technology, Repair, and Service

SUPPLIES

Your Textbook – Small Engines, by R.T. Miller. You will not be assigned a textbook. All textbooks are a classroom set and will remain in the classroom. Time will be given to complete work in class. If you need to check out a book, you will have to check one out via the library system.

Notebook & Folder- Keep your notes and handouts neat and organized. This will especially help on studying for tests and quizzes.

Pencil or Pen- You need something to write with.

Safety Glasses – Student's responsibility to bring and keep. Safety glasses must say Z-87.

Small Engine- Students need to provide the first engine for the class. They work in groups of 2 on 1 engine. So if you don't have an engine, it does not prevent you from taking the course. The following are guidelines for the engine:

- Single Cylinder
- Under 25 Horsepower
- Briggs & Stratton
- Engine needs to be off unit (if possible)
- L-Head Engine (flat cylinder head)
- 4 Stroke Engine

*If you can't find an engine that meets all of these guidelines, talk with the instructor to work out another alternative.

**Students are responsible for the engine at all times (lockers will be provided with locks for storage in the classroom). Students are responsible to transport the engine to school and back home when done with the course.

***This is a learning environment, life happens. Parts may be lost and/or broken, and engines may not run when complete (though that is the ultimate goal). This being said, take care not to bring engines with a lot of value to the class. The instructor is not responsible for the engine or any parts on the engine.

INSTRUCTIONAL STRATEGIES

Instructional strategies that will be used in this course, but are not limited to are: direct instruction, active participation, videos, presentations, cooperative learning, animations, student projects, technology, note taking, demonstrations, and lab activities.

ASSESSMENTS

Summative – These will be unit tests. Tests will always be announced in advance. There will also be lab activities that will be graded for completion for each unit.

Quizzes - These may be announced or unannounced.

Formative – I will use white boards, discussions, and written assessments that are ungraded to assess student knowledge throughout the units.

Self – Homework assignments are graded but are also a way for students to check their own knowledge. Students are expected to check their own answers and we will have time in class to go over questions.

GRADING

Your grade will be based on the following:

Tests – Tests will always be announced in advance. Take the tests seriously and do a good job. Each unit will have a test over all of the information in the unit including component identification and lab activities. Makes up about 25% of your grade.

Quizzes – These may be announced or unannounced. Pay attention during demonstrations and presentations, there may be a quiz over it the following day. Makes up about 15% of your grade.

Homework – There will be day to day work throughout the semester that you need to complete. In order to learn the material, it is wise to take this work seriously to improve your learning in the class. Makes up about 10% of grade.

Other assignments or projects – Other assignments, projects, and lab activities will be assigned throughout the year. Information will be given at the time the assignment. Engine disassembly and reassembly is a major part of this class. Makes up about 50% of your grade.

Grading Scale:

| | | |
|-----------------|-----------------|-----------------|
| 93.0 – 100% A | 80.0 – 82.99 B- | 67.0 – 69.99 D+ |
| 90.0 – 92.99 A- | 77.0 – 79.99 C+ | 63.0 – 66.99 D |
| 87.0 – 89.99 B+ | 73.0 – 76.99 C | 60.0 – 62.99 D- |
| 83.0 – 86.99 B | 70.0 – 62.99 C- | Below 60% |

Please keep track of your scores so that you can figure your own grade at any time.

ABSENCES

If you miss class FOR ANY REASON it is your responsibility to get the assignment. Assignment sheets will be given to you during class time. Be sure to pick up anything that you may have missed when you were absent.

If you miss class on a test/quiz day, you will be expected to take the test/quiz on the day you return to school. If you miss the day before a previously announced test/quiz, you will be expected to take the test/quiz with the rest of your class. If you miss more than one day I will work with you to make other arrangements.

Try not to miss this class. Most people find it difficult to make up small engines. If you know you will be gone, be sure to get the assignment before you leave.

Problems with absences (excused or unexcused) or tardies will be handled according to the Senior High School attendance policy.

GETTING HELP

If you are having trouble with small engine technology, you need to get help IMMEDIATELY. I will be available after school most days, and before school on days when we have no meetings scheduled. My prep time is 4th hour and I am available that time most days. Let me know when you want to meet me so I can be sure I'm in my room when you are looking for me. You may also come in without an appointment, but it may take a few minutes to track me down. A lot of what we do in this class is in the lab with engines, so you will need to make arrangements to come in to make up work when I am available.

BEHAVIOR EXPECTATIONS AND CLASS RULES

You are in high school, and I expect you to behave as the responsible students that you are. Should a problem arise I may contact your parents and/or pursue assistance from the office. If a serious offense occurs, you will be asked to leave the classroom. At no time will I allow a disruption to the educational environment.

Cheating on anything for this class (tests, quizzes, assignments or projects) will not be tolerated. Consequences may include, but are not limited to, a score of zero on the work, contacting your parents and/or Assistant Principal, or an F in the course.

All other rules in regards to Tardies, Cell-phone usage, proper internet usage, etc. We will follow the Senior High School rules which are found in your student handbook.

Cell phones are not allowed in the classroom or lab. Get used to it, employers do not like cell phones either. The only exception is for researching with the instructor's permission.

1. Everyone **will** wear safety glasses in the lab.
2. Common Sense – THINK- Be kind and respectful to others and don't waste your life.
3. No "horseplay" (running, pushing, wrestling, physical contact, etc.)
4. No swearing, threatening, intimidating or derogatory language at anytime.
5. No food, drinks, etc., may be brought to the classroom or lab area.
6. All tools and equipment will be respected and well maintained.
7. If it is not yours and you do not have permission, Don't touch it!
8. Students are to remain in the classroom or lab area unless the instructor gives permission.
9. Tools and equipment should only be used if trained by the instructor and the safety tests have been passed.
10. Students and/or engine owners are responsible for all parts needed for service, though not required.
11. All accidents must be reported to the instructor immediately.
12. All students are responsible for cleaning up at the end of class and putting all tools and equipment away.
13. Theft and vandalism will be dealt with severe consequences.

Failure to follow the rules will result in detention, office and/or parent intervention, or a drop from the class depending on severity and/or quantity.

"Actions have consequences,
Consequences are predictable,
You are responsible for your actions,
Therefore, you are responsible for your consequences."

COMMUNICATION

The best way to contact me with any questions or concerns is via email (lzuck@dbqschools.org). You may also reach me by phone at 552-5578. Messages left will be returned as soon as possible. I will update your grades on Power School usually within one or two days of the assignment, test, or activity.