

Course Overview:

Students in class will study the theory and operation of two-and four-stroke engines. They will gain hands-on experience by disassembling, analyzing, and reassembling small engines. Students will be encouraged to bring in projects needing repair from home. This course integrates and reinforces basic science and mathematical concepts while providing hands-on experience for students.

Department Technology and Engineering	Instructor: Retana /Sherwood
Course Number: TEC 2020	Office Hours: arranged as needed
Credits Earned/Length of Course: .5 credit / Semester Course	Instructor Contact Info: Phone: 608-204-3675 Email: jeshewood@madison.k12.wi.us
Required Materials: writing device needed every day	Other: Shoes that cover and protect the foot; NO sandals, shower shoes or flip flops

Course Standards:

- [Common Core State Standards for Literacy in All Subjects](#)
- [Common Core State Standards for Mathematics -- Standards for Mathematical Practice](#)
- [Wisconsin Common Career Technical Core Standards](#)
- [Wisconsin Standards for Technology and Engineering](#)
- [National Automotive Technician Education Foundation \(NATEF\) Automotive Service Technician \(AST\) Level Standards](#)

Course Assessment(s):

- Summative assessments for each unit, both written and practical quizzes.
- Completion of *sp2 Mechanical Safety* program.
- Completion of Briggs & Stratton Basic Technical training online program

Course Outline (including Unit(s) of Time and Essential Questions):

Unit 1 Safety, Tools, and Basic Skills Review (10 days)

- What basic safety information does a student need to know when participating in Outdoor Power Equipment Technology Class?
- What shop safety information does a student need to know before and during a class in the Auto Shop?
- What basic tools should a student be able to recognize and use after completing this class?

Unit 2 Understanding the Small Engine (5 days) UPDATE

- What would a student need to know to understand the construction of a 4 stroke internal combustion engine?
- What would a student need to know to understand the function of each stroke of the internal combustion engine?
- What would a student need to know to understand the function of the timing marks on the cam drive gear and the camshaft gear?
- What would a student need to know to understand the difference between a 2 stroke and a 4 stroke engine?
- What would a student need to know to understand the function of the valves, piston, crankshaft, camshaft, flywheel and magneto in a small engine?

Unit 3 Tune up for Small Engine powered equipment (5

Days) **UPDATE**

- What information would a student need to know to understand the basic tune up and repair of a small 4 stroke engine, and small engine powered equipment?

Unit 4 Small engine powered equipment maintenance (5

Days) **UPDATE**

- What information would a student need to know to understand the basic process for minor repairs of a small 4 stroke engine?
- What information would a student need to know to understand the basic process for minor seasonal adjustments for the maintenance of a small 2 stroke engine?

Unit 5 Small engine disassembly, reassembly, repairs and adjustments (15

days) **UPDATE**

- What information would a student need to know to start a small engine before disassembly?
- What information would a student need to know to completely disassemble the engine?
- What information would a student need to know to verify all critical measurements on all bearing and other wear surfaces?
- What information would a student need to know keep all parts and fasteners together to prevent parts and fasteners from being lost or reinstalled incorrectly?
- What information would a student need to know reassemble the small engine correctly?
- What information would a student need to know make all adjustments correctly so the small engine will run on reassembly?

Unit 6: Mechanical components of 2 stroke small engines (3-5 days) **UPDATE**

- What information would a student need to know to identify all of the components of a two stroke small engine and identify their purpose?

- What information would a student need to know to properly set up/adjust all components so the engine would start and continue to run correctly after disassembly / reassembly

Unit 7: Career Development/21st Century Skills

- How do the skills and knowledge I am learning in this class get applied within a job setting?
- How can I work with a team to develop an answer to a question or solution to problem?
- How I apply the skills that my future employers will value?

Texts, Technology, and Resources:

- SP2 online safety training www.sp2.org
- Briggs and Stratton Online technical training www.thepowerportal.com
- Small Engines 3rd. edition R. Bruce Radcliff, ed. Briggs and Stratton, American Technical Publishers, Inc. Homewood, IL 60430-4600
- Small Engine Care & Repair The editors of Creative Publishing International, Inc., in cooperation with Briggs & Stratton Corporation Copyright 2003 ISBN 1-58923-122-8
- Briggs & Stratton Single Cylinder "L" Head (Built after 1981) Repair Manual Briggs and Stratton Inc., Menomonee Falls, WI.
- Briggs & Stratton Single Cylinder OHV Repair Manual Briggs & Stratton Inc., Menomonee Falls, WI.

CLASSROOM EXPECTATIONS:

- **ALL CELL PHONES WILL BE STORED IN SAFETY GLASSES BOX DURING CLASS. NO CELL PHONE USE DURING CLASS TIME IS PERMITTED. IF THIS IS AN ISSUE FOR YOU, DROP THIS CLASS NOW.**
- **Grading** is based on earning points for written work, lab work, final exam daily participation, and exhibiting good employability skills
- **Written work** must be made up on student's time
- **Lab work** may be made up within one week
- **Missed tests** must be made up within one week
- **ONLY hand written notes taken in student's automotive notebook may be used during testing.**
- **Safety Glasses** are required in the shop **AT ALL TIMES** and for all lab activities
- Wear or bring **clothes that allow you to work in the shop** every day. **Shoes that cover and protect your feet** are required in the shop. Sandals, shower shoes, slippers, crocs and similar footwear are not permitted in the shop. Students who are not dressed properly will not be permitted to work in the shop, will lose all lab points for the day and will be sent to their principal's office.
- **Shop Tools** and Equipment care and maintenance are everyone's responsibility. **Shop clean-up** is also everyone's job. Tool Inventory is everyone's responsibility and will be done daily.

Grading Percentages:

40% Lab Grade -- Based on performance in the shop, employability skills and daily participation in the classroom and shop.

30% Class work –Visual assessments of participation in the class and shop and completion of unit lab packets

20% Tests and Quizzes – SP2 scores, safety quiz, parental signature sheet return and unit tests

10% Final Exam

Grading scale percentages:

100-90 A

89-80 B

79-70 C

69-60 D

60 and lower Failure

IMPORTANT INFORMATION TO KNOW:

- **Safety** is everyone's responsibility. Learn and follow all lab safety rules
- If you are **injured**, tell the teacher immediately. If anyone is seriously injured, you may be asked to call 911. From any school phone dial 9 and then 911
- **Reading and writing assignments** are part of all classes. You will be **graded on the correct use and spelling** of automotive vocabulary words and appropriate grammar.
- **Class time** will be **available for reading** and writing assignments. Textbooks are kept in the cabinet at the back of the room. Books are available for overnight check out with teacher permission.
- You will **not leave** the shop **without permission** for any reason
- You **will not leave school property during class** for any reason
- We **will all be together** in one location; either in the lab or the classroom.
- The last 15 minutes of the block is for clean-up and assessment. **Attendance will be taken again** at the end of class

School Policies are in effect in this area:

1. No food in lab or classroom
2. **No Cell Phones without permission!!!**
3. No Hats.
4. No headphones or other listening devices without permission
5. No passes will be written during the first and last 15 minutes of the block

Security

Madison Metropolitan School District and all of its students and employees have the right to be safe in their school building. All school entrances are secured during the school day. As an auto class member you are responsible for maintaining building security by keeping all exterior doors closed and locked during the school day.

Having continued access to the auto shop is dependent upon maintaining building security. If the auto shop is seen as a security risk, the district will have to weigh the value of the auto program against the security of everyone in the building.

NO ONE may be admitted to the building through entrances in the M wing **without direct observation by and permission** from a faculty or staff member.

M-14 cannot be secured. Cell phones, wallets, computers, backpacks or any other personal property is your responsibility. You may keep notes and handouts in the file cabinet in the back of the room.

Respect & Responsibility

As the teacher I have the responsibility to deliver well designed learning opportunities for you. These opportunities will have a purpose, specific learning objectives, and some form of assessment that will allow both of us to know whether or not you “got it” I respect your right to spend your time here learning skills that will help you keep and maintain your personal vehicle.

As the student you have the responsibility to participate in the learning opportunities. You have a responsibility to your classmates to respect their opportunity to participate. You have an obligation to participate in the learning process AND the assessment process. I will be asking you to assess your own understanding of the material that I have covered. You have a responsibility to ask questions, and I have a responsibility to answer your questions.

Together, we have material to cover and we need to respect the value of our time together and not waste it.

<p style="text-align: center;">P PERSONAL RESPONSIBILITY</p>	<ul style="list-style-type: none"> • On time • Completes work on time • Active learner • Off and away • Team player • Cleans up after self and lab • Brings pencil and paper • Attends all classes • Be safe towards self and others
<p style="text-align: center;">R RESPECT</p>	<ol style="list-style-type: none"> 1. Active listener 2. Focused 3. Eliminating derogatory language 4. Respect for facility: clean it, respect for machines capabilities 5. Help everyone to be safe 6. Quiet when teacher is talking 7. Allow the teacher to pace the learning
<p style="text-align: center;">I INTEGRITY</p>	<ol style="list-style-type: none"> 1. Do your own work 2. Be patient – wait your turn 3. Share equipment 4. Clean up
<p style="text-align: center;">D DETERMINATION</p>	<ol style="list-style-type: none"> 1. Earn the grade you want (your best possible) 2. Set goals, be a learner 3. Ask for help 4. Learn from mistakes and from other’s mistakes

<h1 style="font-size: 2em; margin: 0;">E</h1> <p style="margin: 0;">EXCELLENCE</p>	<ol style="list-style-type: none"> 1. Challenge yourself to be better 2. Aim high 3. Strive for quality work 4. Do more than what is asked
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CAREER READINESS

Employability Skills & Professional Characteristics That Are Expected:

- Works Productively
- Listens & Learns Effectively
- Can Work as a Team Member
- Communicates Clearly
- Works Cooperatively
- Thinks Critically & Creatively
- Acts Responsibly
- **Shows up ON TIME DAILY**
- Works Safely at all times
- Displays Craftsmanship
- Arrives Prepared
- Plans Ahead
- Can Work Alone
- Respects Others & the Instructor
- Uses Appropriate Language
- Willingness to Accept Direction
- NO cell phone during work time
- Remains Alert & Involved

Employability Skills Conduct Grade

You will be graded on Employability Conduct in this class. These skills will ultimately have a great effect on your employment success. Employability Conduct counts for 40% of your final grade. You have the potential to earn 20 points per day.

Inappropriate Behavior

- 20 pts. Unexcused Absences
- 5 to 10 pts. Not wearing Safety Glasses when reminded
- 5 to 10 pts. Play fighting or physically inappropriate behavior
- 10 to 15 pts. Leaving Class/Lab without permission
- 5 to 15 pts. Sitting around doing nothing in the Lab
- 5 to 15 pts. Wearing a hat in class
- 5 to 5 pts. Personal electronic devices seen/used in class
- 10 pts. Disrupting the learning process
- 5 to 15 pts. Treating others in a disrespectful manner
- 5 to 15 pts. Unacceptable behavior in class or the shop
- 5 to 15 pts. Treating tools or facility in a disrespectful/inappropriate manner
- 10 pts. Not participating in clean-up duties.

SkillsUSA is a partnership of students, teachers and industry representatives; working together to ensure America has a skilled work force. SkillsUSA helps each student excel.

SkillsUSA is a national nonprofit organization serving teachers and high school and college students who are preparing for careers in trade, technical and skilled service occupations, including health occupations.

SkillsUSA is a club activity here at LaFollette. It meets once a week for the entire school year and prepares students for skill competition and professionalism in a future career. It allows participants to demonstrate their desire for higher level achievement in technical professions.

Career and Technology Education students are **encouraged**, but not required to participate in SkillsUSA