**Agriculture Education: Agriculture Power and Equipment**

**COURSE SYLLABUS**

**COURSE TITLE: Agriculture Power and Equipment**

**INSTRUCTOR:** Mr. Danny Wilson

 Cumberland County High School

 660 Stanley Street

 Crossville, TN 38555

 (931)484-9541

**COURSE DESCRIPTION:**

Agricultural Power and Equipment is an applied course in agricultural engineering with special emphasis on laboratory activities involving small engines, tractors, and agricultural equipment. The standards in this course address navigation, maintenance, repair, and overhaul of electrical motors, hydraulic systems, and fuel-powered engines as well as exploration of a wide range of careers in agricultural mechanics. Upon completion of this course, proficient students will be able to pursue advanced training in agricultural engineering and related fields at a postsecondary institution.

**Textbook:** Herren, Ray Agricultural Mechanics, Fundamentals and Applications, 4th Edition ISBN: 0-7668-1410-6

**GRADING AND EVALUATION PROCEDURES:**

 **Assignments Possible Points**

Quizzes 100 points each

 Daily Assignments 100 points each

 Tests/Exams 100 points each

 Lab/Shop 100 points each

 Notebooks 100 points each

**Value or Percentage of Grade**

 Quizzes and Tests 40%

 Daily/Lab Assignments 40%

Final Exam 20%

**GRADE DETERMINATION**

93%-100% = A

 85%-92% = B

 75%-84% = C

 70%-74% = D

 Below 70% = F

**COURSE REQUIREMENTS**

 This course is designed to introduce students to Agricultural Education and Agriscience. Students are asked to do his/her own work and follow all instruction in the class for their own safety. Each student will be provided a folder that will remain in my room for daily writing assignments to be checked by me for a notebook grade at the end of each week. This folder will also house any work and tests and the student is responsible for keeping their notebook up to date at all times. Students are also expected to come to class with paper and pencil, or other materials that are necessary as deemed by me.

 Each student must **TAKE** and **PASS** a Safety Exam with **100%** before they will be allowed to enter the shop or lab. Students will be introduced to and using tools and equipment in the shop or lab and safety is of the utmost importance. **This policy will be enforced at all times, no questions asked.**

**DISCIPLINE PLAN**

**Expectations**

1. Be respectful of everyone in the class at all times.
2. Bring all materials to class and be prepared to work when the bell rings.
3. Please raise your hand when you have a question or when you need to leave the room.
4. You may not leave the room unless you have a hall pass signed by me and you have also signed out on the sign-out log sheet.
5. No cell phones or other electronic devices allowed in class. These devices will be taken up and turned in to administration.
6. Stay in your seat until the bell rings.
7. No horseplay in the classroom, shop, or greenhouse at any time!
8. No student will be allowed in the shop unless instructed by me. Safety glasses will be worn at all times in the shop when working with the equipment.
9. Follow all other classroom, shop, and school board rules at all times.

**Consequences**

1. Verbal Warning
2. Phone call and/or meeting with parent or guardians
3. Report to Administration. Discipline form will be written.

**Personal Statement**

I, Mr. Wilson, will do my best to insure the safety and learning for all students. I will also try to make each class fun and exciting. Students are asked to be respectful, participate, and keep an open mind. Good behavior will be rewarded accordingly. I encourage all students to find something they enjoy and excel in. Agriculture is a worldwide industry and opportunities abound for anyone interested in any of the careers available.

**Additional Information**

Students enrolled in an agriculture class have the option of joining the National FFA Organization. The dues for the organization are $15, which includes membership and t-shirt. It is strongly encouraged that students join, where they will participate in an abundance of activities during and after school. FFA builds the foundation of premier leadership, personal growth, and career success for all of its members. For more information on FFA, you may visit http://www.ffa.org

Attached is a copy of the state standards and competencies for this course. Students/Parents are asked to review the competencies because these are the requirements that the students will be expected to learn and understand by the end of the course. If you have read and understand these standards and this syllabus, please sign below.

Course Standards

Occupational Awareness & Safety

1. Consult industry manuals to ascertain the specific safety prevention and control standards governing the agricultural engineering industry. Demonstrate adherence to recognized standards, and apply occupational safety concepts across all coursework, such as but not limited to procedures surrounding general safety, personal safety (such as the use of personal protective equipment), lifting, transporting, alerting, and reporting.
2. Review common laboratory safety procedures for tool and equipment operation in the agricultural power and equipment laboratories, including but not limited to accident prevention and control procedures. Demonstrate the ability to follow safety and operational procedures in a lab setting and complete a safety test with 100 percent accuracy.
3. Use local news media, organizational websites, and real-time labor market information to investigate occupations in agricultural power and equipment. Compare and contrast the knowledge, skills, and abilities necessary for employment, as well as the typical level of education required.

Career Awareness

1. Gather and analyze information from multiple authoritative sources such as the United States Bureau of Labor Statistics (BLS) to develop a written projection of the occupational trends related to agriculture power and equipment. Supplement the narrative with relevant and properly cited charts, graphs, and other visual representations.
2. Investigate opportunities to expand and diversify a Supervised Agricultural Experience (SAE) program as related to agriculture power and equipment. Accurately maintain an activity recordkeeping system and apply proper financial recordkeeping skills to summarize records by completing SAE related applications and reports.

Engine and Motor Mechanics

1. Compare and contrast the first and second laws of thermodynamics as applied to the study of combustion engines. Analyze the theory of operation and efficiency of internal combustion engines with regard to fuels, engine displacement, ignition, lubrication, and cooling.
2. Evaluate and optimize engine performance under load and no-load operation, considering the effects of air temperature, humidity, fuel quality, and engine tuning.

Page 2

1. Citing technical data and documentation of prior work, develop a written recommendation outlining a specific task or procedure for a given engine or motor (such as using a three- phase 5 hp electric motor in order to drive a 125-foot conveyor belt for lifting grain to a 60- foot silo).
2. Demonstrate the ability to troubleshoot single-cylinder engines and electric motors. Create a written estimate of repairs, including parts, labor, time, and total cost.

Agriculture Machinery

1. Recommend the appropriate machinery for a given agricultural application by matching the mechanical need to the scale and magnitude of the specific task. Using clear and coherent writing, justify the recommendation based on availability of parts, operational costs, maintenance, safety, and total cost. For example, recommend the appropriate tractor for a specified task based on power ratings, engine and transmission systems, hydraulic capabilities, hitching, and ballasting.
2. Research the basic types of fuel and lubricants; differentiate their chief components, characteristics and applications as related to agricultural equipment in an explanatory essay.
3. Demonstrate the ability to maintain, troubleshoot, and repair agricultural equipment and create a written estimate of repairs including itemization of parts, labor, time, and total cost.
4. Compose an informational text comparing and contrasting the types and functions of precision and advanced technologies (such as geographic information systems [GIS], global positioning systems [GPS], and unmanned aerial vehicles [UAV]) available to the agriculture industry, citing technical data where appropriate.
5. 1Demonstrate in a live setting or in a presentation the ability to safely operate agriculture equipment, including precision-operated equipment if available.

Hydraulics

1. Write an explanatory text to summarize the components and operational theory of a basic hydraulic system used in an agriculture setting.
2. Design a hydraulic system to perform a specific task, applying the principles of fluid kinematics and hydrostatics to outline how the system functions. The design should include specifications for pumps, pipes, and flow rates.
3. Troubleshoot and repair hydraulic power and control systems used in agricultural equipment such as piston-driven lifts and compression devices (such as shears, crushers). Document the parts and labor involved and draft a repair bill for suitable compensation.

Navigation and Surveying

1. Explain how agricultural enterprises employ geographic information systems (GIS) and global positioning systems (GPS) in their work, including GIS software, GPS receivers, data acquisition, and spatial analysis of data. Debate the legal, ethical, and economic implications of the use of these emerging technologies with regard to maximizing the efficiency and efficacy of agricultural processes, citing specific textual evidence from case studies and news media.
2. Correctly and safely use precision surveying instruments to make measurements of large acreages. Compile a written survey report for use by a lay reader, supplementing the narrative with charts, graphs, and other visual representations to aid comprehension.

**Student Signature:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Parent Signature:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**