EL DORADO UNION HIGH SCHOOL DISTRICT
EDUCATIONAL SERVICES

Course of Study Information Page

COURSE TITLE
Advanced Agricultural Mechanics Technology

DISTRICT COURSE NUMBER	4-DIGIT STATE COURSE CODE (COMPLETED BY SILT)
(#0725)	**4030**

Rationale:

Agriculture is the United States number one employer accounting for up to 22% of the total work force. Agricultural Mechanics has been key to the development of the Agriculture industry. Innovations in the area of mechanics has increased the efficiency of American farmers permitting Americans to spend less than 12% of their income on food. As the field of Ag Mechanics continues to evolve worldwide, students, graduating with training in Advanced Ag Mechanics, will be better prepared to compete for positions in this job market.

Course Description that will be in the Course Directory:

Advanced Agricultural Mechanics Technology is an extension of and builds upon skills and knowledge learned in Agricultural Mechanics Technology. This course will offer Sophmores, Juniors and Seniors the opportunity to further advance their skill profiencies in the areas of woodworking, metalworking, project planning, tool fitting, electricity and electronics, plumbing, cold metal processes, concrete, welding technology, hydraulic & pneumatic systems and basic construction techniques. Comprehensive understanding and application of current safety standards and procedures will be a component of each study unit. Career planning and leadership development through participation in FFA and the maintenance of a Supervised Agricultural Experience (SAE) project will be an integral part of the course.

How Does this Course align with or meet State and District content standards?

This course is aligned with the Agriculture and Natural Resources sector of the Career Technical Education model curriculum standards set by the California State Board of Education in January 2013. Specifically, this course will focus on the agriculture mechanics pathway standards B1.0 - B9.0, B11 - B12.0 as well as basic core standards 1.0- 11.0.

NCLB Core Subjects:

Select up to two that apply:

☐ Arts	☐ Civics and Government	☒ Not Core Subject
☐ Economics	☐ History	
☐ English	☐ Mathematics	
☐ Foreign Language	☐ Reading / Language Arts	
☐ Geography	☐ Science	

CDE CALPADS Course Descriptors:

(See Page 2 for Definitions)

CTE TECH PREP COURSE INDICATORS	CTE COURSE CONTENT CODE	INSTRUCTIONAL LEVEL CODE
☐ Tech Prep (32) (Higher Ed)	☐ CTE Introductory (01)	☐ Remedial (35)
☐ Tech Prep & ROP(33) (Higher Ed)	☐ CTE Concentrator (02)	☐ Honors UC-Certified (39)
☐ ROP (30)	☒ CTE Completer (03)	☐ Honors Non UC-Certified (34)
☒ N/A	☒ Voc Subject **Agriculture**	☐ College (40)
	☐ N/A	☒ N/A

Length of Course: ☒ Year ☐ Semester

Grade Level(s): ☐ 9 ☒ 10 ☒ 11 ☒ 12

Credit:

☒ Number of credits: **10**
☒ Meets graduation requirements (subject **elective**)
☐ Request for UC "a–g" requirements
CSU/UC requirement _____

☐ College Prep

Prerequisites:

Agricultural Mechanics Technology, Instructor Permission

Department(s):	Agriculture (CTE)
District Sites:	Ponderosa High School
Board of Trustees COS Adoption Date:	5/13/2014
Textbooks / Instructional Materials:	Agricultural Mechanics: Fundamentals and Application, Ray V. Herren, Delmar Cengage Learning Publishing, 2010-6th Edition, 978-1-4354-0097-9
Funding Source:	Agriculture Incentive Grant, CTE, Perkins
Board of Trustees Textbook Adoption Date:	5/13/2014

Definitions

CALPADS	California Longitudinal Pupil Achievement Data System
CTE Technical Prep	A course within a CTE technical career pathway or program that has been articulated with a postsecondary education or through an apprenticeship program of at least 2 years following secondary instruction.
Instructional Level Code	Represents a nonstandard instructional level at which the content of a specific course is either above or below a 'standard' course instructional level. These levels may be identified by the actual level of instruction or identified by equating the course content and level of instruction with a state or nationally recognized advanced course of study, such as IB or AP.
Instructional Level Honors, UC Certified	Includes all AP courses.
Instructional Level Honors, non UC Certified	Requires Board approval.
Instructional Level College	Includes ACE courses. Equivalent to college course and content, but not an AP course. Not related to section, but to course.

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Department: **Agriculture**

Course Title: **Advanced Agricultural Mechanics Technology** Course Number: **(#0725)**

Unit Title: **Unit #1 - Agricultural Mechanics Shop Orientation**

Content Area Standards (Please identify the source): List content standards students will master in this unit.

California Career Technical Education Model Curriculum Standards, Agriculture and Natural Resources Pathway Standards
6.0 Health and Safety - Demonstrate health and safety procedures, regulations, and personal health practices and determine the meaning of symbols, key terms, and domain-specific words and phrases as related to the Agriculture and Natural Resources sector workplace environment. (Direct alignment with RSTS 9-10, 11-12.4)
6.1 Locate, and adhere to, Material Safety Data Sheet (MSDS) instructions.
6.2 Interpret policies, procedures, and regulations for the workplace environment, including employer and employee responsibilities.
6.3 Use health and safety practices for storing, cleaning, and maintaining tools, equipment, and supplies.
6.4 Practice personal safety when lifting, bending, or moving equipment and supplies.
6.5 Demonstrate how to prevent and respond to work-related accidents or injuries; this includes demonstrating an understanding of ergonomics.
6.6 Maintain a safe and healthful working environment.
6.7 Be informed of laws/acts pertaining to the Occupational Safety and Health Administration (OSHA).
B1.0 Implement personal and group safety practices.
B1.1 Practice the rules for personal and group safety while working in an agricultural mechanics environment.
B1.2 Integrate accepted shop management procedures and a safe working environment.

Unit Outline: A detailed descriptive summary of all topics covered in the unit. Explain what the students will learn, know and be able to do.

Students will:
1. Identify major work areas in an Ag Mechanics Shop and explain the function and use of each area
2. Understand, explain and demonstrate how to create a safe work enviornment
3. Understand and utilize the safety color coding system for shops
4. Identify and utilize safety gear and protective clothing required in each area of the shop
5. Understand the principles of combustion
6. Understand how to match appropriate types of fire extinguishers to each class of fire
7. Understand and interpret labels on hazardous materials
8. Describe actions/steps required in case of fire, accident, or other shop emergency
9. Understand and appropriately apply all shop policies and procedures

Instructional Strategies: Indicate how the Instructional Strategies support the delivery of the curriculum and the course goals. Indicate how assignments support the Common Core State Standards.

1. Orient and explain each area of the shop; its function, specific safety needs/concerns, and suggested or required safety gear and clothing
2. Shop and safety tests
3. Develop several different shop/work scenarios and require students to identify safety issues/violations and the steps necessary to correct each problem
4. Explain when and how to use safety gear and protective clothing
5. Teacher led discussion, videos demonstrations on the use of a fire extinguisher
6. Hands-on lab to ensure students understand how to identify hazardous materials and the procedures to follow in case of fire, accidents or other shop emergencies.
7. Quiz on shop policies and procedures
8. Hands-on lab to reinforce all topics covered in this unit.

Assessments: Describe the Formative and Summative assessments that will be used to demonstrate learning and mastery of the standards.

1.Hands-on lab will allow students to demonstrate safety procedures. It will afford the instructor the opportunity to observe each student's progress and correct errors timely and ensure student's understand and can apply concepts.
2. Periodically scheduled cleanings will ensure a clean and safe worksite and help monitor student's complaince and understanding
3. Hands-on lab will help ensure students understand what constitutes a hazardous situation and the steps necessary to correct and/or report the situation
4. Written evaluations and instructor observation on safety practices
6. Daily assignments and labs, safety and shop tests
7. Instructor observation

Interventions: Describe methods used to support students who fail to master unit Formative and Summative assessments.

1. Hands-on Labs will allow the teacher the opportunity to identify students who are struggling and provide one-on-one instruction.
2. Peer instruction
3. Establish a "retake" policy for tests and quizes when a student scores below 75% or below 90% on safety tests.

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Department: **Agriculture**

Course Title: **Advanced Agricultural Mechanics Technology** Course Number: **(#0725)**

Unit Title: **Unit #2 - Hand Woodworking and Metalworking**

Content Area Standards (Please identify the source): List content standards students will master in this unit.

California Career Technical Education Model Curriculum Standards, Agriculture and Natural Resources Pathway Standards
B2.0 Apply the principles of basic woodworking.
B2.1 Identify common wood products, lumber types, and sizes.
B2.2 Measure and lay out lumber, calculating board feet and square feet.
B2.3 Identify, select, and implement basic fastening systems.
B2.4 Complete a woodworking project, including interpreting a plan, developing a bill of materials and cutting list, selecting materials, shaping, joining, and finishing.
B5.0 Understand agricultural cold metal processes.
B5.1 Identify common metals, sizes, and shapes.
B5.2 Demonstrate basic tool-fitting skills.
B5.3 Properly lay out materials for a given project.
B5.4 Demonstrate basic cold metal processes (e.g., shearing, cutting, drilling, threading, bending).
B5.5 Complete a cold metal project, including interpreting a plan, developing a bill of materials, selecting materials, shaping, fastening, and finishing.

Unit Outline: A detailed descriptive summary of all topics covered in the unit. Explain what the students will learn, know and be able to do.

Students will:
1. Describe how tools are classified and name the 8 major tool categories according to use
2. Classify and correctly spell commonly used handtools and fasteners
3. Name and identify twelve species of lumber that may be used in woodworking
4. Complete an advanced woodworking project to include: design, pattern creation, lumber selection, layout, tool selection, cutting, assembly and finishing
5. Identify twelve different types of metal and whether they are ferrous or nonferrous. Explain the origin, characteristics and major uses of each metal
6. Mark, cut and file metal
7. Bend square, round and flat steel and form sheet metal
8. Drill and tap holes in metal. Cut threads on bolts and pipe
9. Fasten metal with bolts screws and rivets
10. Solder sheet metal and sweat copper pipe
11. Create an advanced metalworking project from design through finishing phases

Instructional Strategies: Indicate how the Instructional Strategies support the delivery of the curriculum and the course goals. Indicate how assignments support the Common Core State Standards.

1. Teacher Led Discussion and Demonstration of common woodworking tools and fasteners by classification, name and use
2. Quiz on tools and fasteners
3. Introduce students to twelve types of lumber commonly used in woodworking
4. Hands-on labs demonstrating steps/processes in the different phases of woodshop project construction.
5. Advanced woodshop project
6. Metals lab introducing different types of metals, their origin and characteristics
7. Metals lab -demonstrating how to (a) lay out a drawing on metal, (b) mark cut & file metal, (c) bend square, round and flat steel, (d) form sheet metal.
8. Explain and demonstrate how to cut threads with a tap and die, layout and drill holes with a twist drill, and operate power tools.(Safety test and Bolt Buster Lab)
9. Metal lab demonstrating how to solder sheet metal and sweat copper pipe

10. Advanced metalworking project

Assessments: Describe the Formative and Summative assessments that will be used to demonstrate learning and mastery of the standards.

1. Hands-on labs will allow students to demonstrate skills and techniques in woodworking and metalworking and allow the instructor to observe individual student's progress
2. Completion of an advanced woodshop project and an advanced metalworking project will demonstrate student skill proficiencies in key areas
3. Teacher led disscussions will allow for student feedback enabling the instructor to identify problem areas

Interventions: Describe methods used to support students who fail to master unit Formative and Summative assessments.

1. Hands on Labs will allow the teacher the opportunity to identify students who are struggling and provide one-on-one instruction.
2. Peer instruction
3. Establish a "retake" policy for tests and quizes when a student scores below 75% or below 90% on safety tests

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Department: **Agriculture**

Course Title: **Advanced Agricultural Mechanics Technology** Course Number: **(#0725)**

Unit Title: **Unit #3 - Power Tools in the Agricultural Mechanics Shop**

Content Area Standards (Please identify the source): List content standards students will master in this unit.

California Career Technical Education Model Curriculum Standards, Agriculture and Natural Resources Pathway Standards
B1.0 Implement personal and group safety practices.
B1.1 Practice the rules for personal and group safety while working in an agricultural mechanics environment.
B1.2 Integrate accepted shop management procedures and a safe working environment.
B2.4 Complete a woodworking project, including interpreting a plan, developing a bill of materials and cutting list, selecting materials, shaping, joining, and finishing.
B5.4 Demonstrate basic cold metal processes (e.g., shearing, cutting, drilling, threading, bending).
B5.5 Complete a cold metal project, including interpreting a plan, developing a bill of materials, selecting materials, shaping, fastening, and finishing

Unit Outline: A detailed descriptive summary of all topics covered in the unit. Explain what the students will learn, know and be able to do.

Students will:
1. Identify different types of portable power tools, their parts and uses
2. Demonstrate safe use of portable drills, sanders, grinders, and saws in woodworking
3. Explain procedures for using stationary power tools and identify their parts and uses
4. Demonstrate use of various types of saws, joiners, planers and sanders in woodworking
5. Explain procedures for using stationary machines for metalworking, identify their parts and uses
6. Demonstrate how to safely use a drill press, grinder, power metal cutting saw, power shear and metal bender

Instructional Strategies: Indicate how the Instructional Strategies support the delivery of the curriculum and the course goals. Indicate how assignments support the Common Core State Standards.

1. Demonstrate the correct handling, use and storage of portable and stationary power tools and equipment
2. Explain all tool and equipment safety regulations
3. Portable and stationary power tool quizes
4. Explain the difference between power tools used for woodworking and those used for metalworking
5. Hands-on labs

Assessments: Describe the Formative and Summative assessments that will be used to demonstrate learning and mastery of the standards.

1. Hands on lab will allow students to demonstrate safety procedures, proper handling of tools, equipment and materials. It will afford the instructor the opportunity to observe each student's progress and correct errors timely and ensure student's understand and can apply concepts.
2. Teacher led discussion, videos, and demonstrations on safe use of power tools
3. Written evaluations and instructor observation on safety practices
4. Daily assignments and labs, safety and tool tests
5. Instructor observation on how to safely use portable and stationary power tools

Interventions: Describe methods used to support students who fail to master unit Formative and Summative assessments.

1. Hands on Labs will allow the teacher the opportunity to identify students who are struggling and provide one-on-one instruction.
2. Peer instruction
3. Establish a "retake" policy for tests and quizes when a student scores below 75% or below 90% on safety tests.

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Course Title: **Advanced Agricultural Mechanics Technology** Course Number: **(#0725)**

Unit Title: **Unit #4 - Project Planning**

Content Area Standards (Please identify the source): List content standards students will master in this unit.

California Career Technical Education Model Curriculum Standards, Agriculture and Natural Resources Pathway Standards
B2.4 Complete a woodworking project, including interpreting a plan, developing a bill of materials and cutting list, selecting materials, shaping, joining, and finishing
B5.5 Complete a cold metal project, including interpreting a plan, developing a bill of materials, selecting materials, shaping, fastening, and finishing.

Unit Outline: A detailed descriptive summary of all topics covered in the unit. Explain what the students will learn, know and be able to do.

Students will:
1. Identify common drawing tools; define and explain drawing symbols and their uses
2. Explain the difference between pictorial and three-view drawings; read and interpret a drawing
3. Create a three-view project drawing
4. Define terms associated with a bill of materials; explain the components of a bill of materials
5. Prepare a written bill of materials
6. Select, plan and construct an advanced level woodworking project
7. Select, plan and build an advanced level metalworking project
8. Create or modify project plans

Instructional Strategies: Indicate how the Instructional Strategies support the delivery of the curriculum and the course goals. Indicate how assignments support the Common Core State Standards.

1. Explain and train students in the use of common drawing tools and symbols
2. Illustrate the differences between pictorial and three-view drawings and explain how to read and interpret each.
3. Hands-on Lab to allow students practice in interpreting and sketching drawings
4. Quiz on drawing tools, symbols, and types of drawings and their uses
5. Explain the components that comprise a bill of materials, related terms, and required calculations
6. Quiz on preparation of a bill of materials
7. Consult with and advise students on how to select a woodworking and metalworking project
8. Individual student project will allow students to practically apply advanced knowledge and skills learned in Units #1-4

Assessments: Describe the Formative and Summative assessments that will be used to demonstrate learning and mastery of the standards.

Student demonstrations, quizes, labs and an Individual Student Project will demonstrate the proficiency level of each student. These types of assessment tools will allow the instructor to quickly identify problem areas and take appropriate steps to ensure a high level of proficiency for all students.

Interventions: Describe methods used to support students who fail to master unit Formative and Summative assessments.

1. Hands on Labs will allow the teacher the opportunity to provide one-on-one instruction to students who are struggling with the Unit concepts and application.
2. Peer instruction

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Course Title: **Advanced Agricultural Mechanics Technology** Course Number: **(#0725)**

Unit Title: **Unit #5 - Tool Fitting**

Content Area Standards (Please identify the source): List content standards students will master in this unit.

California Career Technical Education Model Curriculum Standards, Agriculture and Natural Resources Pathway Standards
B1.0 Implement personal and group safety practices.
B2.0 Apply the principles of basic woodworking.
B5.0 Understand agricultural cold metal processes.

Unit Outline: A detailed descriptive summary of all topics covered in the unit. Explain what the students will learn, know and be able to do.

Students will:
1. Learn and demonstrate how to safely repair and recondition tools
2. Learn and demonstrate how to safely sharpen tools

Instructional Strategies: Indicate how the Instructional Strategies support the delivery of the curriculum and the course goals. Indicate how assignments support the Common Core State Standards.

1. Teacher led discussion and safety test
2. Tool Repair Lab to instruct students when and how to repair and recondition various types of tools. Provide different scenarios requiring students to identify tools in need of repair and demonstrate the steps involved to successfully complete the repair.
3. Tool Sharpening Lab to instruct students on how to safely and correctly sharpen tools. Opportunities provided for students to perform these skills
4. Oral presentations by students explaining steps involved in the repair and reconditioning of different types of tools

Assessments: Describe the Formative and Summative assessments that will be used to demonstrate learning and mastery of the standards.

1. Safety test
2. Tool Repair Lab will allow student to demonstrate proficiency in the repair and reconditioning of tools.
3. Tool Sharpening Lab will allow students to demonstrate how to safely and correctly sharpen tools.
4. Individual student presentations demonstrate student's knowledge and skill level and their ability to clearly present concepts

Interventions: Describe methods used to support students who fail to master unit Formative and Summative assessments.

1. Hands on Labs will allow the teacher the opportunity to provide one-on-one instruction to students who are struggling with the Unit concepts and application.
2. Peer instruction
3. Establish a "retake" policy for tests and quizes when a student scores below 75% or below 90% on safety tests.

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Department: **Agriculture**

Course Title: **Advanced Agricultural Mechanics Technology** Course Number: **(#0725)**

Unit Title: **Unit #6 - Gas Heating, Cutting, Brazing and Welding**

Content Area Standards (Please identify the source): List content standards students will master in this unit.

California Career Technical Education Model Curriculum Standards, Agriculture and Natural Resources Pathway Standards
B7.0 Understand oxy-fuel cutting and welding.
B7.1 Explain the role of heat and oxidation in the cutting process.
B7.2 Properly set up, adjust, shut down, and maintain an oxy-fuel system.
B7.3 Flame-cut metal with an oxy-fuel cutting torch.
B7.4 Fusion-weld mild steel with and without filler rod by using oxy-fuel equipment.
B7.5 Repair metal objects using a variety of techniques, such as brazing or hard surfacing.
B9.0 Assimilate metallurgy principles and fabrication techniques.

Unit Outline: A detailed descriptive summary of all topics covered in the unit. Explain what the students will learn, know and be able to do.

Students will:
1. Identify and explain major parts of propane and oxyacetylene welding equipment
2. Learn and demonstrate how to change oxygen and acetylene cylinders, turn on and adjust oxyacetylene controls, light and adjust oxyacetylene torches, shut off and bleed equipment, and check for leaks in gas equipment.
3. Correctly write names and characteristics of common fuels used for cutting
4. Explain, demonstrate and apply recommended safety practices for using oxyfuels
5. Select appropriate pressures for using common fuel gases for cutting
6. Explain and demonstrate how to cut and pierce steel with oxyfuels
7. Explain nature and uses of braze welding
8. Prepare metal for welding, identify joints commonly used in welding
9. Braze and braze weld butt, lap, and fillet joints
10. Fuse weld mild steel with and without filler rod
11. Complete a welding project.

Instructional Strategies: Indicate how the Instructional Strategies support the delivery of the curriculum and the course goals. Indicate how assignments support the Common Core State Standards.

1. Teacher Led Discussion and Safety Test
2. Quizes on parts of welding equipment and names and characteristics of common cutting fuels
3. Student demonstrations
4. Welding Lab and Demonstrations
5. Welding Lab and Demonstrations

Assessments: Describe the Formative and Summative assessments that will be used to demonstrate learning and mastery of the standards.

1. Safety test, Quizes
2. Welding lab will allow student to demonstrate oxyfuel cutting, brazing and welding in a safe and controlled environment
3. Welding lab will allow students to demonstrate how to change cylinders, adjust controls, shut off and bleed equipment
4. Welding lab will allow students to complete a welding project and or repair

Interventions: Describe methods used to support students who fail to master unit Formative and Summative assessments.

1. Hands on Labs will allow the teacher the opportunity to identify students who are struggling and provide one-on-one instruction.
2. Peer instruction
3. Establish a "retake" policy for tests and quizes when a student scores below 75% or below 90% on safety tests.

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Department: **Agriculture**

Course Title: **Advanced Agricultural Mechanics Technology** Course Number: **(#0725)**

Unit Title: **Unit #7 - Arc Welding**

Content Area Standards (Please identify the source): List content standards students will master in this unit.

California Career Technical Education Model Curriculum Standards, Agriculture and Natural Resources Pathway Standards
B8.0 Understand electric arc welding processes.
B8.1 Select, properly adjust, safely employ, and maintain appropriate welding equipment (e.g., gas metal arc welding, shielded metal arc welding, gas tungsten arc welding).
B8.2 Read welding symbols and plans, select electrodes, fit-up joints, and control heat and distortion.
B8.3 Apply gas metal arc welding, shielded metal arc welding, or flux core arc welding processes to fusion-weld mild steel with appropriate welding electrodes and related equipment.
B8.4 Weld a variety of joints in various positions.
B9.7 Construct a welding project using any electric welding process, appropriate products, joints, and positions, which will include interpreting a plan, determining proper assembly sequence, developing a bill of materials and cutting list, selecting and acquiring materials, and developing a clear and concise fabrication contract.

Unit Outline: A detailed descriptive summary of all topics covered in the unit. Explain what the students will learn, know and be able to do.

Students will:
1. Safely operate electrical welding equipment
2. Describe the shielded metal arc welding process
3. Select suitable supplies and equipment for a shielded metal arc welding project
4. Test welds for quality and strength.
5. Explain and demonstrate GMAW and GTAW welding
6. Perform horizontal, vertical and overhead welds
7. Complete an advanced welding project

Instructional Strategies: Indicate how the Instructional Strategies support the delivery of the curriculum and the course goals. Indicate how assignments support the Common Core State Standards.

1. Teacher Led Discussion and Safety Test
2. Demonstration
3. Welding Lab and Demonstrations
4. Welding Lab and Demonstrations
5. Welding Lab for project completion

Assessments: Describe the Formative and Summative assessments that will be used to demonstrate learning and mastery of the standards.

1. Safety test
2. Hands-on welding lab will allow students to demonstrate proficiency in ARC welding in a safe and controlled environment
3. Hands-on lab will allow students to demonstrate how to perform horizontal, vertical and overhead welds
4. Hands-on lab will allow students to complete an advanced welding project and test welds for quality and strength
5. Student demonstrations exhibit a student's knowledge and skill level and their ability to clearly present concepts

Interventions: Describe methods used to support students who fail to master unit Formative and Summative assessments.

1. Hands on Labs will allow the teacher the opportunity to identify students who are struggling and provide one-on-one instruction.
2. Peer instruction
3. Establish a "retake" policy for tests and quizes when a student scores below 75% or below 90% on safety tests.

EL DORADO UNION HIGH SCHOOL DISTRICT

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Department: **Agriculture**

Course Title: **Advanced Agricultural Mechanics Technology** Course Number: **(#0725)**

Unit Title: **Unit #8 - Electricity and Electronics**

Content Area Standards (Please identify the source): List content standards students will master in this unit.

California Career Technical Education Model Curriculum Standards, Agriculture and Natural Resources Pathway Standards
B3.0 Demonstrate basic electricity principles and wiring practices commonly used in agriculture.
B3.1 Explain the relationship between voltage, amperage, resistance, and power in single-phase alternating current (AC) circuits.
B3.2 Use proper electrical test equipment for AC and direct current (DC) circuits.
B3.3 Analyze and correct basic circuit problems (e.g., open circuits, short circuits, incorrect grounding).
B3.4 Implement proper basic electrical circuit and wiring techniques using nonmetallic cable and conduit as defined by the National Electric Code (NEC).
B3.5 Interpret basic agricultural electrical plans.
B3.6 Complete an electrical project, including interpreting a plan, following NEC code, selecting materials and components, and completing a circuit
B11.6 Understand the theory and operation of 12-volt DC electronic and electrical systems (e.g., circuit design, starting, charging, and safety circuits).

Unit Outline: A detailed descriptive summary of all topics covered in the unit. Explain what the students will learn, know and be able to do.

Students will:
1. Use appropriate safety measures when working around and with electricity
2. Identify and correct circuit problems
3. Design and install a wiring system
4. Install, extend and modify branch circuits
5. Explain basic principles and components of electronics
6. Identify typical electronic applications in Agriculture and strategies for maintaining electronic components and equipment.
7. Identify types of electric motors, advantages of electric motor power, and factors to consider when selecting motors
8. Identify and explain motor mounts and drives
9. Demonstrate how to use and maintain motors and controls

Instructional Strategies: Indicate how the Instructional Strategies support the delivery of the curriculum and the course goals. Indicate how assignments support the Common Core State Standards.

1. Teacher led discussions, safety test
2. Electrical Lab will allow students to practice skills and applications increasing understanding and proficiency
3. Branch circuit project will allow students to develop problem solving skills as well as practical application
4. Test on principles of electronics and its applications in Agriculture
5. Oral presentation on electric motors

Assessments: Describe the Formative and Summative assessments that will be used to demonstrate learning and mastery of the standards.

1. Safety demonstration and test
2. Electrical Lab will allow students to demonstrate and apply practical skills in designing and maintaining electrical systems
3. Electronics test will demonstrate student's understanding of principals of electronics and their application
4. Oral presentation will require students to select a type of motor, research and present information on how the motor starts, runs, is designed and maintained. Must be able to field questions from other students.

Interventions: Describe methods used to support students who fail to master unit Formative and Summative assessments.

1. Hands on Labs will allow the teacher the opportunity to provide one-on-one instruction to students who are struggling with the Unit concepts and application.
2. Peer instruction
3. Establish a "retake" policy for tests and quizes when a student scores below 75% or below 90% on safety tests

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Department: **Agriculture**

Course Title: **Advanced Agricultural Mechanics Technology** Course Number: **(#0725)**

Unit Title: **Unit #9 - Plumbing, Hydraulic, and Pneumatic Systems**

Content Area Standards (Please identify the source): List content standards students will master in this unit.

California Career Technical Education Model Curriculum Standards, Agriculture and Natural Resources Pathway Standards
B4.0 Select and apply plumbing system practices commonly used in agriculture.
B4.1 Match appropriate basic plumbing fitting skills with a variety of materials, such as copper, polyvinyl chloride (PVC), steel, polyethylene, and acrylonitrile butadiene styrene (ABS).
B4.2 Explain the environmental influences on plumbing and irrigation system choices (e.g., filter systems, water disposal, drip vs. flood).
B4.3 Research and communicate how various plumbing and irrigation systems are used in agriculture.
B4.4 Complete a plumbing project, including interpreting a plan, developing a bill of materi¬als and cutting list, selecting materials, joining, and testing.
B11.4 Explain the theory, operation, and troubleshooting of hydraulic systems

Unit Outline: A detailed descriptive summary of all topics covered in the unit. Explain what the students will learn, know and be able to do.

Student will:
1. Review basic plumbing tools, fittings and assembly processes
2. Identify and explain the benefits of irrigation, select an irrigation system, use moisture sensors and determine cost factors associated with irrigation
3. Design, install and maintain an irrigation system
4. Compare hydraulic and pneumatic systems
5. Identify and explain basic theories of fluid dynamics
6. Identify and explain major components of fluid systems
7. Use and maintain fluid power tools and equipment
8. Understand basic concept of robotics

Instructional Strategies: Indicate how the Instructional Strategies support the delivery of the curriculum and the course goals. Indicate how assignments support the Common Core State Standards.

1. Teacher led discussion, written and hands-on tests on basics of plumbing
2. Irrigation Lab allows students to learn about the benefits, types, tools and costs associated with irrigation systems
3. Irrigation Lab allows students to design, install and maintain an irrigation system
4. Teacher led discussions regarding principles of hydraulics and pneumatics
5. Professional presentation by an expert in the field of hydraulics and pnuematics
6. Tool Lab allows students practical application experience in using and maintaining fluid power equipment
7. Presentation by an expert in the field of agricultural robotic applications

Assessments: Describe the Formative and Summative assessments that will be used to demonstrate learning and mastery of the standards.

1. Hands-on labs allow students to demonstrate understanding and application of skills and principles covered in this unit.
2. Irrigation design project allows students to demonstrate the processes involved with irrigation systems

Interventions: Describe methods used to support students who fail to master unit Formative and Summative assessments.

1. Hands on Labs will allow the teacher the opportunity to provide one-on-one instruction to students who are struggling with the Unit concepts and application.
2. Peer instruction

EDUCATIONAL SERVICES

Department: **Agriculture**

Course Title: **Advanced Agricultural Mechanics Technology** Course Number: **(#0725)**

Unit Title: **Unit # 10 - Concrete and Masonry**

Content Area Standards (Please identify the source): List content standards students will master in this unit.

California Career Technical Education Model Curriculum Standards, Agriculture and Natural Resources Pathway Standards
B6.0 Understand concrete and masonry practices commonly used in agriculture.
B6.1 Identify and explain the use of concrete and masonry tools and demonstrate proper handling of concrete materials.
B6.2 Practice bed preparation, concrete forms layout, and construction.
B6.3 Complete a concrete or masonry project, including calculating volume, developing a bill of materials, assembling, mixing, placing, and finishing

Unit Outline: A detailed descriptive summary of all topics covered in the unit. Explain what the students will learn, know and be able to do.

Students will:
1. Identify concrete tools and their uses
2. Understand and explain the different compositions of concrete based on use
3. Explain and demonstrate how to prepare forms for concreting
4. Select and mix the correct combination of ingredients for a batch of concrete. Pour into prepared forms and finish
5. Explain and demonstrate how to insulate concrete floors
6. Understand, explain and calculate the amount of materials needed for a concrete and block job
7. Demonstrate the steps involved in laying a block retaining wall.

Instructional Strategies: Indicate how the Instructional Strategies support the delivery of the curriculum and the course goals. Indicate how assignments support the Common Core State Standards.

1. Tool Lab allows student to learn and demonstrate the correct use and care of concrete tools
2. Present several different types of concrete projects; have students determine the correct concrete mix to use in each case and explain why
3. Hand-on Lab allows students to prepare forms, mix, pour , finish and insulate concrete
4. Quiz on how to calculate material needs for several different concrete and block projects.
5. Hands-on Lab allows student to demonstrate how to lay a block retaining wall

Assessments: Describe the Formative and Summative assessments that will be used to demonstrate learning and mastery of the standards.

1. All Labs will present students with opportunity to practically apply the skills learned in this unit.
2. All projects require students to explain as well as demonstrate each process
3. Quiz shows understanding of the calculations involved in estimating material needs

Interventions: Describe methods used to support students who fail to master unit Formative and Summative assessments.

1. Hands on Labs will allow the teacher the opportunity to provide one-on-one instruction to students who are struggling with the Unit concepts and application.
2. Peer instruction
3. Establish a "retake" policy for tests and quizes when a student scores below 75% or below 90% on safety tests

EDUCATIONAL SERVICES

Department: **Agriculture**

Course Title: **Advanced Agricultural Mechanics Technology** Course Number: **(#0725)**

Unit Title: **Unit #11 - Planning and Constructing Agricultural Structures**

Content Area Standards (Please identify the source): List content standards students will master in this unit.

California Career Technical Education Model Curriculum Standards, Agriculture and Natural Resources Pathway Standards
B12.0 Apply land measurement and construction techniques commonly used in agriculture.
B12.1 Describe common surveying techniques used in agriculture (e.g., leveling, land measurement, building layout, GPS).
B12.2 Draw and interpret architectural plans.
B12.3 Install single- and three-phase wiring and control systems found in agricultural structures, pumps, and irrigation systems.
B12.4 Install plumbing in agricultural structures (e.g., potable water, sewer, irrigation).
B12.5 Form, place, and finish concrete or masonry (e.g., concrete block).
B12.6 Construct agricultural structures by using wood framing and steel framing systems (e.g., barns, shops, greenhouses, animal structures).
B12.7 Develop clear and concise agricultural construction contracts.

Unit Outline: A detailed descriptive summary of all topics covered in the unit. Explain what the students will learn, know and be able to do.

Student will:
1. Understand considerations for site planning
2. Determine primary and auxillary uses for structure, then determine size and layout of building.
3. Identify major types of buildings used in Agricultural settings
4. Name major parts of a building
5. Design, construct and insulate an agricultural building.
6. Identify structures used in aquaculture, greenhouse and hydroponics technology and explain any special construction requirements based on each use.
7. Construct an aquaculture facility, a greenhouse or an hydroponics unit
8. Identify, explain uses, advantages and disadvantages of various types of fencing
9. Identify different types of materials used in fencing
10. Explain and demonstrate the proper methods used in building fences including safety rules

Instructional Strategies: Indicate how the Instructional Strategies support the delivery of the curriculum and the course goals. Indicate how assignments support the Common Core State Standards.

1. Hands-on projects allow students to practically apply skills learned in this unit and demonstrate their proficiency
2. Quizes on types of buildings, parts of a building, types of fencing and different materials used in fencing.
3. Safety quizes
4. Teacher and student led discussions

Assessments: Describe the Formative and Summative assessments that will be used to demonstrate learning and mastery of the standards.

1. Hands-on Labs/projects allow teacher to observe how well students understand and apply skills taught in this unit
2. All projects require students to explain as well as demonstrate each process
3. Quiz shows understanding and retention of the topic information.

Interventions: Describe methods used to support students who fail to master unit Formative and Summative assessments.

1. Hands on Labs will allow the teacher the opportunity to provide one-on-one instruction to students who are struggling with the Unit concepts and application.
2. Peer instruction
3. Establish a "retake" policy for tests and quizes when a student scores below 75% or below 90% on safety tests

EL DORADO UNION HIGH SCHOOL DISTRICT

EDUCATIONAL SERVICES

Department: **Agriculture**

Course Title: **Advanced Agricultural Mechanics Technology** Course Number: **(#0725)**

Unit Title: **Unit #12 - Careers in Agricultural Mechanics**

Content Area Standards (Please identify the source): List content standards students will master in this unit.

California Career Technical Education Model Curriculum Standards, Agriculture and Natural Resources Pathway Standards
3.0 Career Planning and Management
Integrate multiple sources of career information from diverse formats to make informed career decisions, solve problems, and manage personal career plans. (Direct alignment with SLS 11-12.2)
3.3 Explore how information and communication technologies are used in career planning and decision making.
3.4 Research the scope of career opportunities available and the requirements for education, training, certification, and licensure.
3.9 Develop a career plan that reflects career interests, pathways, and postsecondary options.

Unit Outline: A detailed descriptive summary of all topics covered in the unit. Explain what the students will learn, know and be able to do.

The student will:
1. List two to five careers for each area within Ag Mechanics.
2. Identify skill sets needed for three differnt careers in Ag Mechanics
2. Develop a detailed educational plan to prepare for a career in Ag Mechanics.
3. Shadow an Ag Mechanics professional in the field and prepare a written report about the experience

Instructional Strategies: Indicate how the Instructional Strategies support the delivery of the curriculum and the course goals. Indicate how assignments support the Common Core State Standards.

1. Career Search in Career Center
2. Online career searches
3. Student Data Sheet listing careers selected and the skill sets and educational requirements for each. Oral presentation
4. Have students identify skill sets they possess at the beginning of the course and then re-evaluate again at the end of the course.
5. Written assignment on work shadow program
6. Have students prepare or update their resume.

Assessments: Describe the Formative and Summative assessments that will be used to demonstrate learning and mastery of the standards.

1. Oral Presentations will demonstrate how thoroughly students researched selected careers and the educational and skill requirements for each.
2. Self evaluations at the beginning and end of the course will teach students how to identify and assess their skill sets and effectively present this information in a resume or oral interview.

Interventions: Describe methods used to support students who fail to master unit Formative and Summative assessments.

1. Divide projects into multiple steps each with a separate due date.
2. Review each step of a student's project to ensure an understanding of the project and expected outcome. This affords the instructor the opportunity to identify problem areas early and implement corrective actions as needed to allow students to successfully complete each project.

EDUCATIONAL SERVICES

Department: **Agriculture**

Course Title: **Advanced Agricultural Mechanics Technology** Course Number: **(#0725)**

Unit Title: **Unit #13 - Supervised Agricultural Experience Project (SAEP)**

Content Area Standards (Please identify the source): List content standards students will master in this unit.

California Career Technical Education Model Curriculum Standards, Agriculture and Natural Resources Pathway Standards
10.0 Technical Knowledge and Skills
Apply essential technical knowledge and skills common to all pathways in the Agriculture and Natural Resources sector, following procedures when carrying out experiments or performing technical tasks. (Direct alignment with WS 11-12.6)
10.6 Manage, and actively engage in, a career-related, supervised agricultural experience.
10.7 Understand the importance of maintaining and completing the California Agricultural Record Book.

Unit Outline: A detailed descriptive summary of all topics covered in the unit. Explain what the students will learn, know and be able to do.

The student will:
1. Develop a long range SAEP plan.
2. Maintain a Supervised Agricultural Experience Project.
3. Explain the importance of sound business and management decisions
4. Maintain accurate records

Instructional Strategies: Indicate how the Instructional Strategies support the delivery of the curriculum and the course goals. Indicate how assignments support the Common Core State Standards.

1. Student Data Sheets
2. California FFA Record Books
3.Teacher/student led discussions

Assessments: Describe the Formative and Summative assessments that will be used to demonstrate learning and mastery of the standards.

1. Instructors will review and grade FFA Record Books at set points during the semester. Suggestions for improvements or missing information will be provided to each student who will be expected to correct the errors or omissions and resubmit the Record Book for review.
2. Regular peer group meetings of students participating in the same type of SAEP for sharing of information and problem solving
3. Instructor follow-up on progress of each student's SAEP

Interventions: Describe methods used to support students who fail to master unit Formative and Summative assessments.

1. The process of reviewing each student's record book and returning it for corrections allows the instructor to identify problems early, affording students the opportunity to learn from and correct mistakes.
2. Peer Group meetings and Instructor project review assists students in having a successful SAEP

EL DORADO UNION HIGH SCHOOL DISTRICT

EDUCATIONAL SERVICES

Department: _____

Course Title: _____ Course Number: _____

Unit Title:

Content Area Standards (Please identify the source): List content standards students will master in this unit.
Unit Outline: A detailed descriptive summary of all topics covered in the unit. Explain what the students will learn, know and be able to do.
Instructional Strategies: Indicate how the Instructional Strategies support the delivery of the curriculum and the course goals. Indicate how assignments support the Common Core State Standards.
Assessments: Describe the Formative and Summative assessments that will be used to demonstrate learning and mastery of the standards.
Interventions: Describe methods used to support students who fail to master unit Formative and Summative assessments.

EL DORADO UNION HIGH SCHOOL DISTRICT

EDUCATIONAL SERVICES

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Assessments: Describe the Formative and Summative assessments that will be used to demonstrate learning and mastery of the standards.
Interventions: Describe methods used to support students who fail to master unit Formative and Summative assessments.