Kansas Agriculture Education

Advanced Ag Mechanics

Name _____ SSN ____-___-_____

Instructor _____School Year_____

RATING SCALE: 3: Skilled, works independently
2: Competent, may need assistance
1: Received instruction, skill undeveloped
0: No exposure, instruction or training

INTEGRATION: (M) Math (S) Science
(E) Language Arts (L) Lab Activity
(C) Career Development Skill
(EB) Experienced Based
(LK) Life Knowledge

Enrollment Date ____/____/____ Completion Date ____/____/____ Hours completed _____

I certify that the student received the training in the area indicated.

Student Signature _____ Date _____

Instructor Signature _____ Date _____

Competencies _____/129

I. The Ag Mechanics Industry and Careers

3 2 1 0 1. Describe 15 careers in the field of ag mechanics (E)
3 2 1 0 2. Explain the importance of welding and construction in the local economy (E)
3 2 1 0 3. Identify 10 regional businesses that require welding skills
3 2 1 0 4. Write a 1 and ½ page paper over two agriculture careers of interest (E)
3 2 1 0 5. Select an agriculture career, research, and write a ½ page report over the education needed

II. Supervised Agriculture Experience (SAE) & Record Keeping

3 2 1 0 1. Identify and maintain the SAE (C)
3 2 1 0 2. Construct a personal budget (M)
3 2 1 0 3. Utilize the Kansas FFA SAE Record book to monitor the SAE (C)
3 2 1 0 4. Complete a local and district proficiency award applications (E)
3 2 1 0 5. Complete chapter and/or State FFA Degree applications (E)
3 2 1 0 6. Use Quicken to track income and expense in cash, checking, and savings (C)
3 2 1 0 7. Track SAE skills developed, hours worked as well as FFA, school, and community activities using the Ag Ed record book (C)
3 2 1 0 8. Set appropriate SAE long and short term goals (E)

A. Lab Activities (L)(EB)

3 2 1 0 1. Prepare income and expense records (C, M)
3 2 1 0 2. Prepare monthly cash flow statements (C, M)
3 2 1 0 3. Record personal and business inventories, assets, and liabilities (C, M)

III. The National FFA Organization and Leadership

3 2 1 0 1. Participate in Student Development activities established by the local POA (C)
3 2 1 0 2. Participate in Chapter Development activities established by the local POA (C)
3 2 1 0 3. Participate in Community Development activities established by the local POA (C)
3 2 1 0 4. Participate in the Welding and/or Ag Mechanics FFA Career Development Events (C)
3 2 1 0 5. Construct a project to display at local and state Ag Mechanics project shows (L)

IV. Arc Welding

3 2 1 0 1. Explain the physical processes of arc welding (S)
3 2 1 0 2. List the proper arc welding safety guidelines (S)
3 2 1 0 3. Identify arc welding safety hazards (S)
3 2 1 0 4. Differentiate between AC and DC welding (S)

A. Lab Activities (L)(EB)

3 2 1 0 1. Demonstrate an arc weld bead and pad weld
3 2 1 0 2. Demonstrate an arc weld flat butt weld
3 2 1 0 3. Demonstrate an arc weld lap weld in the flat position
3 2 1 0 4. Demonstrate an arc weld T-weld in the flat position
3 2 1 0 5. Demonstrate a multi-pass horizontal arc butt weld
3 2 1 0 6. Demonstrate a horizontal arc butt weld
3 2 1 0 7. Demonstrate a horizontal arc T-weld
3 2 1 0 8. Demonstrate a horizontal arc lap weld
3 2 1 0 9. Demonstrate a vertical butt arc weld
3 2 1 0 10. Demonstrate a vertical lap arc weld

V. MIG Welding

3 2 1 0 1. List the proper MIG welding safety guidelines (S)
3 2 1 0 2. Identify MIG welding safety hazards (S)
3 2 1 0 3. Identify pieces of MIG welding equipment
3 2 1 0 4. Explain the physical processes of MIG welding (S)

A. Lab Activities (L)(EB)

3 2 1 0 1. Demonstrate a MIG bead and pad weld
3 2 1 0 2. Demonstrate a MIG flat butt weld
3 2 1 0 3. Demonstrate a MIG lap weld in the flat position
3 2 1 0 4. Demonstrate a MIG T-weld in the flat position
3 2 1 0 5. Demonstrate a MIG horizontal butt weld
3 2 1 0 6. Demonstrate a MIG horizontal lap weld
3 2 1 0 7. Demonstrate a MIG T-weld in the horizontal position
3 2 1 0 8. Demonstrate a MIG vertical butt weld
3 2 1 0 9. Demonstrate a MIG vertical T-weld

VI. Oxy-Acetylene Welding and Cutting

3 2 1 0 1. List the oxy-acetylene welding and brazing safety guidelines (E)
3 2 1 0 2. List the oxy-acetylene cutting safety guidelines (E)
3 2 1 0 3. Explain the physical processes of oxy-acetylene welding, cutting, and brazing (E)

A. Lab Activities (L)(EB)

3 2 1 0 1. Demonstrate oxy-acetylene cutting techniques

VII. Plasma Cutting

3 2 1 0 1. List the plasma cutting safety guidelines (E)
3 2 1 0 2. Explain the processes of plasma cutting and proper the techniques involved.

A. Lab Activities (L)(EB)

3 2 1 0 1. Demonstrate plasma cutting techniques

VIII. General Shop/Machine Tool Use

3 2 1 0 1. Explain the use and function of the bench grinder (E)
3 2 1 0 2. Explain the use and function of the hand grinder (E)
3 2 1 0 3. Explain the use and function of the chop saw (E)
3 2 1 0 4. Explain the use and function of the hot saw (E)
3 2 1 0 5. Explain the use and function of the floor sheer (E)
3 2 1 0 6. Explain the use and function of the drill press (E)
3 2 1 0 7. Explain the use and function of power hand drills (E)
3 2 1 0 8. Explain the use and function of pneumatic tools (E)
3 2 1 0 9. List the proper bench grinder safety guidelines

3 2 1 0 10. List the proper hand grinder safety guidelines
3 2 1 0 11. List the proper chop saw safety guidelines
3 2 1 0 12. List the proper hot saw safety guidelines
3 2 1 0 13. List the proper floor sheer safety guidelines
3 2 1 0 14. List the proper drill press safety guidelines
3 2 1 0 15. List the proper power hand tools safety guidelines
3 2 1 0 16. List the proper pneumatic tools safety guidelines
3 2 1 0 17. List the proper woodworking hand tool safety guidelines
3 2 1 0 18. List the proper woodworking power tool safety guidelines

A. Lab Activities (L)

3 2 1 0 1. Demonstrate the proper bench grinder safety guidelines
3 2 1 0 2. Demonstrate the proper hand grinder safety guidelines
3 2 1 0 3. Demonstrate the proper chop saw safety guidelines
3 2 1 0 4. Demonstrate the proper hot saw safety guidelines
3 2 1 0 5. Demonstrate the proper floor sheer safety guidelines
3 2 1 0 6. Demonstrate the proper drill press safety guidelines
3 2 1 0 7. Demonstrate the proper power hand tools safety guidelines
3 2 1 0 8. Demonstrate the proper pneumatic tools safety guidelines
3 2 1 0 9. Demonstrate the proper woodworking tools safety guidelines

IX. Layout and Setup of Projects

3 2 1 0 1. Read blueprints and follow detail plans for project construction
3 2 1 0 2. Make and read a working drawing on the computer (E)
3 2 1 0 3. Estimate materials needed for a project
3 2 1 0 4. Calculate project costs (M)
3 2 1 0 5. Prepare a bill of materials on the computer with the metal price list
3 2 1 0 6. Identify types of metal (E)
3 2 1 0 7. Construct group projects
3 2 1 0 8. Construct individual projects

X. List of MAJOR PROJECTS CONSTRUCTED (L)

3 2 1 0 1. _____

3 2 1 0 2. _____

3 2 1 0 3. _____

XI. Safety / Ag Mechanics Lab Orientation

3 2 1 0 1. Identify and demonstrate proper methods of shop/lab clean-up
3 2 1 0 2. Identify various tool storage locations
3 2 1 0 3. Learn the components of the fire triangle
3 2 1 0 4. Explain the proper use of a fire extinguisher
3 2 1 0 5. Explain proper shop safety color coding

A. Lab Activities (L)(EB)

3 2 1 0 1. Complete a shop/lab safety test with 100% accuracy

XII. Advanced Small Engine Repair

3 2 1 0 1. Uses proper Mechanics Safety
3 2 1 0 2. Uses proper tools and operational techniques
3 2 1 0 3. Diagnose Electrical System Errors
- Ignition, Starting, Charging
3 2 1 0 4. Diagnose Fuel Systems Errors
- Gasoline, EFI, Gaseous (LP)
3 2 1 0 5. Analyze Advanced Failures
3 2 1 0 6. Tear Down and Reassembly Procedures
3 2 1 0 7. Hands-On Diagnosis and Troubleshooting in a variety of areas

XIII. Mathematics Career Development Skills (C)

3 2 1 0 1. Estimate, apply, and solve problems involving fractions, decimals, and percentages (M)
3 2 1 0 2. Translate written and verbal statements into math expressions (M)
3 2 1 0 3. Convert common units of measurement within and/or across measurement systems (M)
3 2 1 0 4. Apply concepts of measurement such as distance, direction, rate, and time (M)
3 2 1 0 5. Construct or interpret tables, charts, maps, and/or graphs (M)
3 2 1 0 6. Decide whether a problem is best solved with a computer, calculator, paper, and pencil, or mental arithmetic techniques (M)

XIV. Career Development Skills (C)

3 2 1 0 1. Follow oral instructions (E)
3 2 1 0 2. Participate in group communication activities (E)
3 2 1 0 3. Give oral directions (E)
3 2 1 0 4. Use language and format appropriate to the subject matter, purpose, and audience (E)
3 2 1 0 5. Set priorities that several tasks will be accomplished (C)
3 2 1 0 6. Utilize time management to reduce conflicts (C)
3 2 1 0 7. Apply rules including punctuality, attendance, and work ethic (C)
3 2 1 0 8. Access and use information to develop educational and career options (C)
3 2 1 0 9. Demonstrate stress management skills (C)

XV. Computer Literacy (C)

3 2 1 0 1. Define, understand, and use common computer technology terms (C)
3 2 1 0 2. Compose, organize, and edit information using a computer (C)
3 2 1 0 3. Use presentation software to design and create a presentation (C)
3 2 1 0 4. Use agricultural related software/websites (C)
3 2 1 0 5. Access, navigate, and use on-line services (C)
3 2 1 0 6. Send and receive email messages with enclosures (C)
3 2 1 0 7. Use Quicken to manage personal finance (C)
3 2 1 0 8. Use Microsoft Office (Word, Excel, Powerpoint, and Internet Explorer) to complete projects (C)

XVI. LifeKnowledge Lessons(LK)

3 2 1 0 1. Keeping a job (HS 39)
3 2 1 0 2. Advancing a career (HS 40)
3 2 1 0 3. Understanding the use of time (HS 41)
3 2 1 0 4. Life balance (HS 42)