MISSION TRAILS REGIONAL OCCUPATION PROGRAM

1. **COURSE TITLE:** Agricultural Construction

2. **CBEDS TITLE:** Agriculture: Mechanics and Engineering Technology

3. **CBEDS NUMBER:** 4030

4. **JOB TITLES:**

Farm Truck Driver
Welder
Farm Equipment Operator
Parts Person
Machine Operator
Farm Mechanic
Equipment Fabricator
Service Technician
Safety Specialist
Agricultural Engineer
Irrigation Specialist
Field Hauler
Ranch Hand
Farm Hand – General
Ag Equipment Assembler & Fitter

5. **COURSE DESCRIPTION**

This course prepares students for entry-level positions in the agriculture industry. Students will study farm equipment operation, repair welding, general farm maintenance including fence and shed construction, electricity, plumbing, concrete, and ropework. This course includes classroom instruction and practical lab work in the shop.

6. **HOURS:** 180

7. **PREREQUISITES:** None

8. **REVISION DATE:** January 2009

9. **COURSE OUTLINE:**

   a. **CONTENT AREA SKILLS:**

      i. **EXPECTED STUDENT OUTCOMES**

      ii. **HOURS OF INSTRUCTION**

COURSE OUTLINE

CONTENT AREA SKILLS	EXPECTED STUDENT OUTCOMES	HOURS CL = Classroom CC = Comm. Class. CP = Co-op Ed.		
Instruction will include:	**Student will be able to:**	**CL**	**CC**	**CP**
1. Measurement • Apply standard English units of measure • Apply metric units of measure	1. Calculate area, volume, board feet 2. Use given materials in efficient methods to least waste/cost saving principles.	2		
2. Tool Use and Maintenance and Shop Safety for Farm Construction Work • Hand and Power Tools • Surveying, squaring and leveling tools • Safety rules and Conditions	1. Tool identification, safety and use 2. Tool selection for the Ag Construction shop 3. Apply techniques in sharpening & refitting tools 4. Shop safety	18		
3. Metalworking, Woodworking • Select proper jointing materials • Be able to select proper wood for a project • Compare and contrast methods, types, and uses of different paints • Select proper metals for projects and their proper process of joining	5. Assemble projects in both wood and metal 6. Use taps, dyes, drills, and common fasteners 7. Construct projects 8. Draft a 3-D drawing for project design	40		
4. Concrete, Masonry • Implement proper forming • Perform Pouring • Finish a slab • Proper slope and grade	1. Understand physical properties of concrete 2. Perform estimation of quantities, figuring costs, and job quotes	10		
5. Plumbing • Use types of threads adequately • Measure threaded pipe • Correctly identify more commonly used fittings	1. Conduct operation and care of plumbing tools 2. Identify and use properly types of fittings 3. Carry out layout and measuring skills	10		
6. Electricity • Assemble and electrical wiring board of display and per instructions	1. Complete splicing and connection of circuit boards 2. Install lighting circuit and receptacle circuits	20		

• Understand common house wiring diagrams • Dissect a panel board	3. Understand and comprehend safety principles with electricity			
7. Electric Welding Process • Select the proper method of joining metals and materials for selected applications.	1. Perform basic welding techniques 2. Use and understand the differences in the processes with respect to ARC, MIG, TIG 3. Complete projects in metal working use bending, drilling, marking, and sawing metal	20		
8. Oxy-Fuel Welding & Cutting • Understand basic principles of Oxy-Fuel welding and cutting. • Differentiate between brazing and joining of flux • Properly use the correct mixture ratio of fuel	1. Perform Oxy-Fuel basic techniques 2. Properly change fuel bottles 3. Perform cutting of metal using the Oxy-Fuel process	18		
9. Ropework • Apply knowledge of commonly used knots within the industry	1. Selection and use of rope 2. Rope identification and care 3. Knots, hitches and their uses 4. Splicing rope	2		
10. Agricultural Structures • Analyze situations such as fence construction, building repair, design factors, and purpose for agricultural setting	1. Identify pole barn structures 2. Identify and understand steel structure Building codes and properties 3. Conduct typical farm fencing operations 4. Identify furrowing facilities stains and stresses.	40		

10. COURSE OUTLINE:

a. CAREER PERFORMANCE STANDARDS

i. EXPECTED STUDENT OUTCOMES

ii. HOURS OF INSTRUCTION

COURSE OUTLINE

CAREER PERFORMANCE STANDARDS	EXPECTED STUDENT OUTCOMES	HOURS
Instruction will include:	**Student will be able to:**	
1. **Personal Skills** ▪ Classroom policies & procedures ▪ Ethics → Work → Business ▪ Sexual harassment laws ▪ Personal skills, including positive attitude, self-confident, honesty, perseverance & self-discipline ▪ Professional appearance ▪ Time management ▪ Lifelong learning	1. **Understand how personal skill development, including positive attitude, honesty, self-confidence, time management, & other positive traits affect employability.** ▪ Demonstrate and understand classroom policies & procedures ▪ Define work and business ethics & demonstrate the importance of ethical standards & social responsibilities in the business environment. ▪ Discuss the laws applicable to sexual harassment & discuss tactics for handling harassment situations. ▪ Demonstrate personal skills in class and/or business environment: → Positive attitude → Self-confidence → Honesty → Perseverance → Self-discipline ▪ Demonstrate and model personal hygiene and acceptable professional attire ▪ Prioritize tasks and meet deadlines ▪ Explain the importance of lifelong learning	**Integrated in content area skills**

CAREER PERFORMANCE STANDARDS	EXPECTED STUDENT OUTCOMES	HOURS
Instruction will include:	**Student will be able to:**	
2. **Interpersonal Skills** ▪ Group dynamics ▪ Conflict resolution and negotiation ▪ Team work ▪ Etiquette across gender and cultural groups	2. **Understand principles of effective interpersonal skills, including group dynamics, conflict resolution, and negotiation.** ▪ Identify and explain the key concepts of group dynamics ▪ Discuss and demonstrate the dynamics of conflict resolution and negotiation, and their importance within the business environment ▪ Demonstrate effective teamwork, share responsibilities, accept supervision and assume leadership roles ▪ Demonstrate cooperative working relationships and proper etiquette across gender and cultural groups	**Integrated in contnt area skills**
3. **Thinking and Problem-Solving Skills** ▪ Critical and creative thinking skills ▪ Logical reasoning and problem-solving skills ▪ Numerical estimation, measurement, and calculation ▪ Identify, locate, and organize needed information and propose, evaluate, and select alternative solutions	3. **Understand the importance of critical thinking and problem-solving skills in the workplace.** ▪ Apply critical and creative thinking skills in a work environment and implement a plan of improvement as needed ▪ Demonstrate logical reasoning and problem solving skills in a work environment ▪ Apply numerical estimation, measurement and calculation skills to business applications including the following: → Whole number math → Decimals & fractions → Counting & monetary functions → Use of tables & graphs ▪ Recognize problem situations; identify, locate and organize needed information, and propose, evaluate and select from alternate solutions	**Integrated in content area skills**

CAREER PERFORMANCE STANDARDS	EXPECTED STUDENT OUTCOMES	HOURS
Instruction will include:	**Student will be able to:**	
4. **Communication Skills** ▪ Written communications ▪ Verbal and Nonverbal communications ▪ Active and effective listening ▪ Proper etiquette in business communications ▪ Writing and editing skills ▪ Use of reference material and handbooks ▪ Oral presentations	4. **Understand principles of effective communication.** ▪ Read and implement written instructions, technical manuals, written communication, and reference books ▪ Present a positive image of verbal and nonverbal communication through use of appropriate methods ▪ Demonstrate active and effective listening skills through verbal, nonverbal and written feedback ▪ Demonstrate proper etiquette in business communications, including an awareness of requisite for international communications (languages, customs, and time zones) ▪ Demonstrate the following writing and editing skills: → Use correct grammar, punctuation, capitalization, vocabulary and spelling → Write, proofread and edit → Select and use appropriate forms of communication ▪ Exhibit a proficiency in the use of reference materials such as dictionary, thesaurus, telephone directory, almanac, zip code directory, and office handbooks	**Integrated in content area skills**
5. **Occupational Safety** ▪ Good safety practices	5. **Understand occupational safety issues, including avoidance of physical hazards** ▪ Model and implement good safety practices including: → Avoidance and reporting of physical hazards in the work environment → Safe operation of equipment → Proper handling of hazardous materials	**Integrated in content area skills**

CAREER PERFORMANCE STANDARDS	EXPECTED STUDENT OUTCOMES	HOURS
Instruction will include:	**Student will be able to:**	
6. **Employment Literacy** ▪ Expand awareness of career opportunities ▪ Set employment goals and objectives ▪ Aptitudes, personal characteristics and interests ▪ Develop portfolio to C-TAP standards ▪ Develop interviewing techniques	**6. Understand career paths and strategies for obtaining employment.** ▪ Explore career opportunities and develop a career plan ▪ Identify steps for setting goals and writing personal goals and objectives ▪ Examine aptitudes related to career options; relate personal characteristics and interests to educational and occupational opportunities ▪ Develop a portfolio to include the following: → Letter of Introduction → Cover letter → Resume → Thank you letter → Job application → Licenses, Certificates and Awards → Transcripts → Letters of Recommendation → Work Samples	**Integrated in content area skills**
7. **Technology Literacy** ▪ Apply Industry specific technology ▪ Use Industry specific software ▪ Demonstrate keyboarding ▪ Accessing information ▪ Lifelong enhancement of technology skills	7. **Understand and adapt to changing technology.** ▪ Identify and demonstrate use of appropriate technology ▪ Identify and use industry specific software ▪ Demonstrate proficiency in alphanumeric keyboarding ▪ Input and retrieve information ▪ Understand the importance of lifelong learning in adapting to changing technology	**Integrated in content area skills**

10. ADDITIONAL RECOMMENDED /OPTIONAL ITEMS

a. ARTICULATION:	None
b. VOCATIONAL CREDIT:	10 Credits
c. ACADEMIC CREDIT:	Vocational Credits, Elective Credits
d. INSTRUCTIONAL STRATEGIES:	Lecture, Demonstration, Hands-on Application, Group Work, Community Classroom, Cooperative Learning
e. INSTRUCTIONAL MATERIALS:	Basic Hand Tools, Technical Manuals, Diagnostic Tools, Multi-media, Live and Demonstration Welding, Mechanical Tools
f. CERTIFICATES:	Available upon completion of course or completion of semester