

Advanced Ag Structures Technology 18406

Rationale Statement:

This course is offered to meet more advanced needs in the agricultural structures industry. South Dakota demand is increasing with the shortage of certified electricians, plumbers, contractors and mechanics. Classroom and laboratory content may be enhanced by utilizing appropriate equipment and technology. Algebra, geometry, trigonometry, English and human relations skills will be reinforced in the course. Work-based learning strategies appropriate for this course are school-based enterprises and field trips. This class is reinforced through the FFA Ag Mechanics Career Development Events and related Proficiency Awards. Each student will be expected to complete a Supervised Agricultural Experience Program or Internship project.

Suggested grade level: 11th – 12th

Topics covered:

- Safety
- Operating equipment and machinery
- Electrical systems
- Construction plans
- Designing building and agriculture facilities
- Construction
- Concrete/masonry
- Plumbing

Indicator #1: Use safe practices associated with planning and constructing agricultural structures.

Bloom's Taxonomy Level	Standard and Examples
Applying	<p>Ad S 1.1 Demonstrate safe use and proper skills necessary in the construction of agricultural structures.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Demonstrate safe use of measurement and layout tools. • Demonstrate safe and proper techniques when using hand and power tools. • Recognize dangers associated with ag structures. • Utilize machinery and equipment safely.
Applying	<p>Ad S 1.2 Demonstrate safe use of machinery and equipment.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Describe function of machine controls and instrumentation. • Perform appropriate start-up procedures. • Select proper machines(s) for specific task(s). • Perform pre-operation inspection. • List applicable laws for on- and off-highway operation. • List safety measures to moving of building and construction equipment.

Indicator #2: Service and repair mechanical equipment and structures.

Bloom's Taxonomy Level	Standard and Examples
Applying	<p>Ad S 2.1 Inspect schematics to service electrical systems.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Compare features and applications of electrical systems including designing the layout and usage of wires on paper. • Interpret symbols and wiring diagrams while demonstrating on the structures. • Interpret electrical systems, components and building codes. • Repair control systems and sensors (e.g., heating and cooling).

Indicator #3: Write structural plans to meet specifications and building codes.

Bloom's Taxonomy Level	Standard and Examples
Applying	<p>Ad S 3.1 Examine blueprints and local codes to develop an applicable construction plan.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Identify parts of a plan or blueprint on individual project of wood or metal. • Identify criteria for different views of a plan or blueprint. • Locate and develop elements of a construction plan. • Identify local code enforcement agencies and procedures. • Read and interpret local code information. • Complete permit applications if building on site.

Indicator #4: Use plans to guide facility design and construction.

Bloom's Taxonomy Level	Standard and Examples
Applying	<p>Ad S 4.1 Design buildings and facilities.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Analyze site/equipment/permit requirements. • Develop drawings of agriculture structures such as feed storage, dairy facilities, animal nurseries, horticulture structures, etc. • Estimate material needs and costs. • Operate Computer Aided Drafting or other comparable computer program.
Applying	<p>Ad S 4.2 Use architectural and mechanical plans to construct agricultural buildings and facilities.</p> <p>Examples:</p> <ul style="list-style-type: none"> • Identify and select appropriate building materials. • Construct projects with wood and metal. • Install electrical wiring components and fixtures. • Apply paint or protective coatings. • Insulate facility. • Install ventilation devices. • Install glass, ridged plastic panels and/or film plastic.

Indicator #5: Use a variety of concrete and masonry products.

Bloom's Taxonomy Level	Standard and Examples
Applying	<p>Ad S 5.1 Demonstrate concrete and masonry procedures.</p> <p>Examples:</p> <ul style="list-style-type: none">• Prepare site for pouring concrete.• Conduct a slump test.• Mix concrete.• Calculate for slope.• Order cement.• Erect and brace a form; place reinforcement devices.• Finish and cure concrete.

Indicator #6: Use a variety of plumbing materials.

Bloom's Taxonomy Level	Standard and Examples
Applying	<p>Ad S 6.1 Use various techniques of plumbing.</p> <p>Examples:</p> <ul style="list-style-type: none">• Select pipe/PVC/tubing type and size.• Cut tubing/PVC pipe.• Install fixtures.• Solder copper tubing.• Flare copper tubing.• Join PVC pipe.