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Agricultural Power & Equipment Technician Program

Course Curriculum

Semester 01 (Tuition: \$2,890)

Course #	Course Title	Credits
31-801-310	Workplace Communication	2

Credits: 2 Lecture Hours: 72

Students apply oral, written, listening, and non-verbal skills to workplace situations. Students discover how to use communication as the key to solving workplace problems, resolving conflicts, working as members of a team, and effectively giving and receiving criticism. Students develop an understanding of diversity in the workplace, harassment issues, and the impact of substance abuse on the job.

31-804-305	Applied Mathematics	2
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Credits: 2 Lecture Hours: 72

Students compute with rational numbers. They make and convert various measurements. Students use formulas to solve problems. They compute dimensions of geometric shapes. Students use statistical tools to represent and analyze data. They analyze various financial situations. Students use basic right triangle trigonometry to solve problems. In each topic area, students solve application problems.

32-070-305	Intro to Ag Electrical Systems	3
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Credits: 3 Lecture Hours: 36 Lab Hours: 72

Students apply the fundamentals of electricity and electronics as it relates to the tractor electrical system. Students gain an understanding of the basic electrical system, reading schematics used to diagnosis these systems and how to apply test procedures for the circuits being studied. Students will learn the various test equipment and meters. They will apply the proper use of the test equipment while learning the basic electrical systems and repair procedures.

32-070-309	Farm Machinery Maintenance	5
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Credits: 5 Lecture Hours: 54 Lab Hours: 126

Students learn to perform preventative maintenance procedures to a variety of agricultural equipment used in production agriculture. During this process the student gains an understanding of belt and chain drives, repair and adjustments, various types of bearings and bearing maintenance, PTO assemblies and associated repair procedures. Basic service maintenance of tractors is covered.

32-070-314	Ag Shop Safety & Practices	1
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Credits: 1 Lecture Hours: 36

Students learn skills required to become productive and efficient in the Agricultural service center. The skill set will include a working understanding of hand tools, power tools, lifting equipment, general shop equipment, fastener applications and the proper torquing procedures for the various fasteners and gasket/sealant application. The student's skills are improved through practice and evaluation in a safety conscious manner. Students will

gain a further understanding of employment opportunities, customer and employer expectations as well as the policies and procedures related to the operation of an Agricultural dealership.

32-442-301 **Related Welding** 2

Credits: 2 Lecture Hours: 18 Lab Hours: 54

The student creates weldments in flat, vertical, horizontal, and overhead positions. These weldments will utilize SMAW, MIG, TIG, brazing and oxyfuel. All operations will adhere to AWS Code.

15

Semester 02 (Tuition: \$2,810)

Course #	Course Title	Credits
32-070-341	Basic Hydraulics	4

Credits: 4 Lecture Hours: 36 Lab Hours: 108

Students disassemble, inspect, and repair hydraulic cylinders, pumps, and valves. Students apply hydraulic theory and principles by drawing hydraulic systems using ISO symbols. Students operate open and closed center hydraulic simulators to relate to the differences in pressure and flow. Prerequisites: Ag Shop Safety & Practices (32-070-314)

32-070-346 **Consumer Equipment Maintenance & Repair** 3

Credits: 3 Lecture Hours: 36 Lab Hours: 72

Students learn the repair concepts of home owner consumer products including Lawn & Garden tractors, riding lawn mowers, snow blowers, string trimmers, and chainsaws. Students learn basic design concepts and the repair and maintenance of the equipment found in everyday residences for home upkeep. Prerequisites: Farm Shop Safety and Maintenance (10-070-103), Ag Safety, Electrical & Maintenance (10-070-104), Ag Shop Safety & Practices (32-070-314), or Ag Safety, Electrical & Maintenance (10-070-105)

32-070-347 **Farm Equipment I** 3

Credits: 3 Lecture Hours: 36 Lab Hours: 72

Students learn the principles of field operation and reconditioning of tillage and planting equipment. Students learn methods of testing, calibrating, adjusting and maintaining the different types of seeding equipment. Emphasis is placed on getting the planting unit field-ready, and how to instruct the customer on proper field operation of the seeding equipment. Prerequisites: Ag Shop Safety & Practices (32-070-314)

32-070-348 **Farm Equipment II** 3

Credits: 3 Lecture Hours: 36 Lab Hours: 72

Students learn the principles of the field operation and reconditioning of hay harvesting equipment. Students learn the different designs of hay cutting equipment and the maintenance procedures associated with the different designs found today. They move through the course to the hay harvesting equipment including small square balers, large square balers, round balers. Students will learn the repair and field adjustment to the knotters used on small and large balers and the wrapping options found on round balers. Prerequisites: Ag Shop Safety & Practices (32-070-314)

32-806-303 **Science of Mechanics** 2

Credits: 2 Lecture Hours: 72

Students compute work, power, acceleration, heat, pressure, and other physical quantities. They explore simple machines and their applications. Students apply those physical quantities to automotive and agricultural power situations.

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Semester 03 (Tuition: \$350)

Course #	Course Title	Credits
32-070-350	Ag Power Occup Internship	2

Credits: 2 Lecture Hours: 0 Occupational Hours: 144

Students apply technical theory and skills on the job. Students diagnose and repair agricultural tractors and equipment. Students practice good communication and customer relation skills. Students develop appropriate employment attitudes. Prerequisites: Farm Equipment II (32-070-348)

2

Semester 04 (Tuition: \$3,060)

Course #	Course Title	Credits
32-070-301	Farm Machinery Harvest	5

Credits: 5 Lecture Hours: 54 Lab Hours: 126

Students operate, recondition, adjust, and maintain many of the different types of harvesting equipment used on modern farms. Students diagnose electro-hydraulic systems used on combines and forage harvesters. Students learn the different types of combine construction and how this affects productivity. Students check for field loss and adjust combines to provide maximum efficiency. Prerequisites: Ag Shop Safety & Practices (32-070-314)

32-070-303	Chassis Drive Systems	5
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Credits: 5 Lecture Hours: 54 Lab Hours: 126

Students diagnose and repair "live" power train problems which include clutches, transmissions, differentials, and PTOs. Students build skills necessary to diagnose and repair power trains on approved projects. Students use time management techniques during lab instruction while performing diagnostic tests and repairs. Students also use the latest computer resource information to gather parts and service information. Prerequisites: Basic Hydraulics (32-070-341)

32-070-344	Air Conditioning	2
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Credits: 2 Lecture Hours: 18 Lab Hours: 54

Students diagnose air conditioning system problems and make necessary repairs. Students will apply the laws and requirements set forth by state and federal agencies and are given the opportunity to take the state mobile air conditioning certification test to repair air conditioning systems upon satisfactory completion of this program. Prerequisites: Ag Shop Safety & Practices (32-070-314)

32-070-345	Advanced Electrical Systems	4
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Credits: 4 Lecture Hours: 36 Lab Hours: 108

Students build on fundamental electrical skills learned in the Starting and Charging Systems course. Students work with simulators and prior approved projects to develop diagnostic skills and repair techniques while learning and making repairs to lighting, control, and monitoring circuits. Students use onboard diagnostics systems and scan tools as an integral part of this course as well as factory technical manuals, online resources, and computer programs to access service and parts information to complete lab projects. Prerequisites: Intro to Ag Electrical Systems (32-070-305)

16

Semester 05 (Tuition: \$2,660)

Course #	Course Title	Credits
32-070-311	Diesel Engines I	5

Credits: 5 Lecture Hours: 54 Lab Hours: 126

Students learn concepts of the diesel engine operation and diagnostic processes used to locate problems within

the engine. Students work with the maintenance and repair of the cooling system, lubrication system, fuel system and intake/exhaust systems. Students will use nozzle testing and repair equipment to make repairs to injection nozzles in the lab. Students will understand proper injection pump failure diagnosis and on tractor adjustments are emphasized as well as an insight into the specialized diesel component repair field that they may find employment in. Prerequisites: Farm Machinery Maintenance (32-070-309)

32-070-312

Diesel Engines II

5

Credits: 5 Lecture Hours: 36 Lab Hours: 144

Students learn how the internal components of the diesel engine work together in theory and in the lab as they apply repair techniques to a diesel engine overhaul project. Students learn how to properly measure the components and make informed decisions on the repair processes warranted as compared to the equipment specifications. This process includes developing a repair estimate to be shared with the customer. Pre/Co-requisites: Diesel Engines I (32-070-311)

32-070-343

Applied Hydraulics

4

Credits: 4 Lecture Hours: 36 Lab Hours: 108

Students learn the working fundamentals of hydraulic systems found on today's agricultural equipment including tractors, combines, skid steers loaders and related equipment through class discussion and lab demonstrations. Students will use hydraulic pressure gauges, flowmeters, diagnostic flow charts and manufacturer technical manuals as they apply theory to lab projects to enforce theory discussion and develop hands-on skills. Students also use the latest computer resource information available to gather parts and service information as it pertains to their lab project. Prerequisites: Basic Hydraulics (32-070-341)

14

Total Credits: 62

Estimated Total Tuition*: \$11,770

Tools/Equipment: \$3,000 (optional)

Additional cost for uniforms.