

Agricultural Power and Equipment Technician

32-070-1 Technical Diploma

Financial Aid Eligible

Program Overview

This program consists of practical knowledge and shop management skills to help students master installation, service, assembly, adjustment, repair, and operation of various types of machinery and tractors. Students will also learn how to work with hydraulics, transmissions, electrical systems, and air conditioning.

Campus:

New Richmond



WISCONSIN
INDIANHEAD
TECHNICAL
COLLEGE

Special Features

As part of the Agricultural Power and Equipment Technician program, students are required to obtain a license to operate a forklift. This allows students to be one step closer in their job preparation in the agricultural industry.

In addition, students in this program will have the opportunity to participate in a State of Wisconsin (http://datcp.wi.gov/Consumer/Weights_and_Measures/License_Applications/Mobile_Air_Conditioning/index.aspx) approved training course designed to certify operators of refrigerant recover/recycling equipment leading to a Mobile Air Conditioning license. Students must pass a final test to receive their license.

Admission Requirements

Students in this program must:

- Complete application form and submit with fee (fee waiver may apply if previously submitted)
- Complete Accuplacer entrance assessment to determine placement (waiver may apply with acceptable alternative test scores and/or postsecondary degree completion)
- Complete admissions interview with a WITC counselor (above requirements should be completed prior to interview)

Student Profile

Students in the Agricultural Power and Equipment Technician program should be able to:

- Manipulate tools and equipment skillfully
- Communicate ideas verbally
- Be organized
- Be willing to work with precise limits and standards
- Walk and move around in shop and field assignments
- Lift and carry 50 pounds
- See and hear well (normal or corrected)
- Distinguish colors

Students should discuss any limitations they may have with a Student Success Center counselor.

Preparation for Admission

Students should strive to reach a comfort level in the following courses or skills:

- Agriculture
- Welding
- Keyboarding
- Electronics
- Drafting
- Auto Mechanics
- English/Speech
- Basic Math/Algebra
- Physics
- Computers
- Power Technology
- Machine Shop
- Print Reading

Program Outcomes

Employers will expect Agricultural Power and Equipment Technician graduates to be able to:

- Follow safety standards
- Rebuild diesel engines
- Apply principles of gasoline and diesel engine operation
- Perform diagnostics on fluid power systems
- Perform diagnostics on electrical systems
- Repair fluid power and electrical systems
- Perform maintenance and repair on transmissions
- Use precision measurement tools accurately

Collegewide outcomes and indicators will also be addressed to develop personal awareness, career effectiveness, and professionalism. See page 5 for a list of collegewide outcomes and indicators.

Career Outlook

Agricultural power and equipment technicians are in demand because they can handle a variety of mechanical situations. The typical positions available after graduation include:

- Equipment Mechanic
- Construction Mechanic
- Diesel Mechanic
- Lawn and Garden Equipment Mechanic

Curriculum

Number	Course Title	Credits
Occupational Specific Courses		
32070326	Engines 1 for Ag Mechanics	5
32070337	12-Volt Electrical Theory for Ag Mechanics	1
32070338	Diesel Engine Theory	1
32070339	Mobile Hydraulics Theory	1
32070341	Power Train Theory	1
32070358	Power Trains 1 ▲	5
32070359	Mobile Hydraulics 1 ▲	5
32070360	12-Volt Electrical 1 ▲	4
32070361	Engines 2 for Ag Mechanics ▲	5
32070364	Power Trains 2 ▲	5
32070366	Mobile Hydraulics 2 ▲	5
32070367	12-Volt Electrical 2 ▲	5
32070368	Basic Tools	1
32070369	Mobile HVAC for Heavy Equipment	1
32442307	Welding for Mechanics	<u>2</u>
		47
Occupational Supportive/ General Studies Courses[†]		
10890100	Success Strategies 1	1
32801361	Applied Communications 1	2
32801363	Applied Communications 2 ▲	2
32804373	Math 373	2
32804383	Math 383 ▲	2
32809371	Applied Human Relations	2
32890305	Applied Information Resources	<u>2</u>
		13
	PROGRAM REQUIREMENTS	60

▲ Requires a prerequisite and/or corequisite that must be completed with a grade point of 2.0 or better.

† See page 40 for General Studies course descriptions.

Course Descriptions

(See page 40 for General Studies course descriptions)

32070326

Engines 1 for Ag Mechanics - Credits: 5

This class will provide the learner with an in depth look at how internal combustion engines operate. The learner will be able to identify, measure, and check out parts of the internal combustion engine, with diesel engines used in agriculture machinery the main area of focus. Updraft carburetors, distributor ignition systems, and magnetos found on agriculture gasoline engines will also be covered.

32070337

12-Volt Electrical Theory for Ag Mechanics - Credits: 1

This course is designed for the learner to understand basic 12-volt electrical circuits, wiring diagrams, starting, charging, and lighting systems. Classroom trainers will be used to apply electrical theory. Using hands-on activities, this course will help the learner to better understand basic 12-volt electrical systems.

32070338

Diesel Engine Theory - Credits: 1

This course will provide the learner with a basic understanding of the diesel engine. The design and operating principles of the engine, cooling, fuel, intake, exhaust systems, and lubrication systems will be examined.

32070339

Mobile Hydraulics Theory - Credits: 1

This course will provide a practical understanding of mobile hydraulic components. Their design, application, operation and maintenance will be studied. A hydraulic training bench will be used in the classroom.

32070341

Power Train Theory - Credits: 1

This course will provide a general overview of clutches, sliding gear, and hydrostatic drives. Design, operation, adjustment, and maintenance will be discussed.

32070358

Power Trains 1 - Credits: 5

This course will provide an in-depth study of hydraulically operated and controlled transmissions as they are found on various types of farm tractors. You will learn transmission operation by studying manufacturers' service manuals as well as a prepared text. Lab projects will allow hands-on training. COREQUISITE: 32070341 Power Train Theory.

32070359

Mobile Hydraulics 1 - Credits: 5

This course will provide a broad, general, and practical coverage of fluid power components and their design, application, operation, and maintenance. You will learn hydraulics operation by studying manufacturers' service manuals as well as a prepared text. Lab projects will allow hands-on training. COREQUISITE: 32070339 Mobile Hydraulics Theory.

32070360

12-Volt Electrical 1 - Credits: 4

This course is designed to study the construction, operation, adjustments, and repairs of electrical components used in tractors and farm implements. Classroom and lab activities will include reading and interpreting wiring diagrams, troubleshooting electrical circuits, and performing repairs on alternators, generators, starters, and regulators. Monitors are also included in this course. COREQUISITE: 32070337 12-Volt Electrical Theory.

32070361

Engines 2 for Ag Mechanics - Credits: 5

This course provides the student with both a theoretical and practical background in the basic operating and rebuilding principles of diesel engines. The course includes practical experience in rebuilding, testing, troubleshooting, and tuning diesel engines. Additionally, the student will gain experience in the proper use of tools and equipment. If prerequisite courses have not been completed, the student must have consent of the instructor to enroll. COREQUISITES: 32070326 Engines 1 for Ag Mechanics and 32070338 Diesel Engine Theory.

32070364

Power Trains 2 - Credits: 5

This course provides an opportunity to work on clutches, transmission torque amplifiers, torque converters, differentials, final drives, and power take-off units. Lab time is spent on disassembly, parts identification, operation, and repair of these units. COREQUISITES: 32070358 Power Trains 1 and 32070341 Power Train Theory.

32070366

Mobile Hydraulics 2 - Credits: 5

This course provides an in-depth study on how the basic fluid power components are incorporated into a tractor hydraulic system. This lecture- and lab-based course includes demonstration and practice opportunities. If prerequisite courses have not been completed, student must have consent of instructor to enroll. COREQUISITES: 32070359 Mobile Hydraulics 1 and 32070339 Mobile Hydraulics Theory.

32070367

12-Volt Electrical 2 - Credits: 5

This is an advanced electrical course to meet the demands of today's newer equipment. Learners will receive training on electronic service tools, pulse width modulation solenoids, can bus controllers, and terminator networks. Additional topics will include yield monitors and auto guidance systems. COREQUISITES: 32070337 12-Volt Electrical Theory and 32070360 12-Volt Electrical 1.

32070368

Basic Tools - Credits: 1

The purpose of this class is to introduce the learner to the basic hand and shop tools that are used by diesel engine service technicians. Precision measuring instruments will also be covered with special emphasis on reading and using micrometers, dial indicators, dial calipers, snap gauges and other shop specialty tools. Students will also be covering forklift safety, with an OSHA forklift operators certificate also being included with the successful completion of this class.

32070369

Mobile HVAC for Heavy Equipment - Credits: 1

Mobile HVAC for heavy equipment will teach the learner the basics of air conditioning systems. Air conditioning fundamentals will be learned along with proper servicing procedures and air conditioning equipment used. In depth study of air conditioning systems from older agriculture equipment will be looked at, along with study of new auto temperature control systems. Laws pertaining to mobile air conditioning will be examined. Upon successful completion of this class the learner will receive their Wisconsin mobile air conditioning certificate.

32442307

Welding for Mechanics - Credits: 2

Instruction in safe setup and operation of oxyacetylene cutting (OAC), SMAW (Stick), GMAW (Mig), FCAW, and/or GTAW (Tig) welding in applications related to general industry practices. Selection of appropriate welding processes with a specific emphasis on typical repair situations including metal identification will be stressed.

Gainful employment information is available at this link: <http://www.witc.edu/pgmpages/agpower/career.htm>. This information is provided as a federal requirement in an effort to help students make informed decisions related to the costs and potential employment in a chosen field.

Graduate Employment Information

(WITC Graduate Survey Responses 2009-2010; for most recent data, go to [witc.edu](http://www.witc.edu))

Number of graduates	6	Number employed	6	% employed in WITC district	83%
Number of responses	6	Percent employed	100%	Range of yearly salary	\$13,584-\$31,458
Number available for employment	6	Employed in related field	6	Average yearly salary	\$26,797

career vision