GREAT PLAINS TECHNOLOGY CENTER
COURSE OF STUDY

Career Cluster:	Agriculture, Food, and Natural Resources (AG)	
Career Pathway:	Agricultural Power, Structures and Technology (AG004)	
Career Major:	Agricultural & Machinery Repair Technician (T&I) (AG0040002)	
Career Major Hours:	Secondary Students:	1590 Hours
	Adult Students:	1590 Hours
Instructor:	Name:	Jim V. Smith
	Office Number:	(580) 335-5525 or 800-460-5525
	E-Mail Address:	jvsmith@greatplains.edu
Academic Credit:	Secondary Students:	3 high school credits per year
	Adult Students:	Transcript
Prerequisites:	None	

Career Major Description:
The Agricultural Machinery & Technology career major is designed to provide a general knowledge of the farm mechanics field. The primary goal of this career major is to provide basic skills necessary for entry level employment in the field of agriculture mechanics and associated equipment, as employed in the farming industry.

The instructional material format presents complex mechanical activities in simple logical sequence. The format allows each student some flexibility and control over the learning rate. Instruction focuses on the basic theories of operation, service, and repair of agricultural engines and applicable farm equipment.

The instructor materials provide an excellent coverage of:
- Internal combustion engine fundamentals
- Power trains
- Electrical and electronic systems
- Hydraulic systems
- Agricultural equipment systems

Career Major Goals:
Students enrolled in this career major will be given the opportunity to develop the skills and attitudes needed to successfully enter the farm mechanics field according to their personal choice, ability, and resourcefulness.

Upon achieving the goals of this career major, students will:
- Become competent in the fundamental skills of the agricultural mechanics field.
- Become qualified for further related education and/or enter into the job market.
- Participate as responsible citizens.
- Develop positive and realistic self-images.
- Develop the ability to work in a safe manner with limited or no supervision.
- Accept and abide by the rules and regulations by the school and/or place of employment.

Career Opportunities:

- Agricultural Hydraulic Technician
- Diesel Engine Technician
- Mechanic's Helper
- New Vehicle Make-Ready Technician
- Power Train Technician
- Electrical Systems Technician
- General Line Technician
- Tire Repair Technician

Career Major Objectives:

After successful completion of this career major, the student will be able to:

- Apply proper personal and equipment safety procedures.
- Demonstrate proper usage of a variety of specialty tools.
- Disassemble, inspect, and repair basic engine components.
- Diagnose, disassemble, inspect, and repair basic power train components.
- Troubleshoot, isolate, and repair basic hydraulic system failures.
- Troubleshoot, isolate, and repair electrical system failures.
- Set-up, adjust, and repair various related farm equipment.

Career Major Course Sequence:

- HS Student and Part-time Adult (Year One): Course Sequence I
- HS Student and Part-time Adult (Year Two): Course Sequence II
- Full-time Adult (Year One): Course Sequence I and II
- Full-time Adult (Year Two): Course Sequence III

DESCRIPTION OF COURSES
SEQUENCE I

Course #	Course Name	HST	HSL	ADT	ADL
TI00596	**Orientation**	**45**	**0**	**45**	**0**

Upon completion of this unit, the student will establish a foundation of knowledge in both the program as well as the occupational field. Additionally, the student will learn the proper safety practices, rules, and attitude required in both the school and in the field. The student will also gain an insight into the SkillsUSA Student Organization.

TI00597	**Machinery Maintenance Fundamentals**	**25**	**80**	**25**	**80**

Upon completion of this unit, the student will become familiar with basic agricultural machinery preventive and normal maintenance practices. This will include all basic maintenance for agricultural equipment and their supporting subsystems.

TI00599	**Internal Combustion Engines**	**25**	**80**	**25**	**80**

Upon completion of this unit, the student will gain a basic understanding of the internal combustion engine. This unit will also provide insight into the necessary associated supporting systems of agricultural internal combustion engine.

TI00598 Power Trains **40 80 40 80**
Upon completion of this unit, the student will obtain an understanding of the major subsystems contained in typical agricultural type power trains, which will include a basic familiarization of the common components in each subsystem.

TI00600 Fluid Power **40 80 40 80**
Upon completion of this unit, the student will obtain a background knowledge of the fundamentals and operating principals of the fields of hydraulics which will include theoretical background as well as established engineering practices.

TI00607 Irrigation Systems Sequence I **10 20 10 20**
Upon completion of this unit, the student will gain a general overview of the various types of irrigation and the related equipment involved. This unit will require off-campus technical observations and practical application.

Sequence I Subtotal Hours:	**Theory**	**Lab**	**Total**
High School Student:	185	340	525
Adult Student:	185	340	525

DESCRIPTION OF COURSES
SEQUENCE II

Course # Course Name **HST HSL ADT ADL**

TI00607 Irrigation Systems Sequence II **10 20 10 20**
Upon completion of this unit, the student will gain a general overview of the various types of irrigation and the related equipment involved. This unit will require off-campus technical observations and practical application.

TI00601 Electrical Systems **40 80 40 80**
Upon completion of this unit, the student will possess a basic understanding of electrical systems found on various forms of agricultural equipment. This will include self-propelled power units as well as supporting equipment.

TI00606 Agricultural Welding Applications **30 60 30 60**
Upon completion of this unit, the student will gain a background into the various welding processes used in the agricultural field. This unit will include both the theory and technical practices of the different processes the student chooses.

TI00604 Harvesting Equipment **50 100 50 100**
Upon completion of this unit, the student will gain an overview of the various types of harvesting equipment. This unit will provide an insight into the fundamentals of operation and theory of agricultural harvesting equipment.

TI00603 Hay and Forage Equipment **45 90 45 90**
Upon completion of this unit, the student will gain an understanding of the mechanical and hydraulic operations of various forms of hay and forage equipment. This will include the major operating principles of the equipment commonly used in this geographical area.

Sequence II Subtotal Hours:	Theory	Lab	Total
High School Student:	175	350	525
Adult Student:	175	350	525

DESCRIPTION OF COURSES
SEQUENCE III

Course #	Course Name	ADT	ADL

TI00605 Air Conditioning **25** **50**

Upon completion of this unit, the student will have a working knowledge of A/C systems in general as well as specific knowledge of A/C systems used on agricultural equipment. This will include theory of refrigeration as well as practial applications and practices.

TI00602 Tillage and Plant Equipment **45** **90**

Upon completion of this unit, the student will gain a background into the various types of tillage and planting equipment commonly used in agriculture. Additionally, this unit will provide basic theory of the usage of various types of this equipment.

TI00706 Agricultural Tires and Tracks **20** **40**

Upon completion of this unit, the student will gain a general overview of the various tire and track systems found in the agricultural field. Students will learn to service, repair and change tires. Students will also cover diagnosis and repair of track systems.

TI00802 Workforce Staging **10** **20**

This course is designed to be delivered as an integrated component within the courses taken by the individual student. The course is designed for the development of leadership, personal development and employability skills.

TI00791 Workforce Induction **80** **160**

This course is a formalized mentorship based instructional process for the purpose of accelerating the learner's skill development and individual transition into the workforce. Content and specific application of skill development is driven on an individual basis by the respective occupation, career major and/or pathway. Definition of a specific learner's content is reflected within an Individual Skill Development Plan (ISDP).

Sequence III Subtotal Hours:	Theory	Lab	Total
Adult Student:	180	360	540

Career Major Total:	Theory	Lab	Total
High School Student:*	360	690	1050
Adult Student:	540	1050	1590

* High school students may complete this career major in an adult enrollment status if necessary. Please see your instructor or counselor for details.

Evaluation Policy:

Employability Grades (100 points per week; 20% of final grade)

The employability skills grade is based on 20 points per day (which may include: attitude, attendance, safety, punctuality, cooperation, participation, clean-up, class preparation, school/classroom rules, and time management). Points will be deducted if these responsibilities are not met at the instructor's discretion. Students will be allowed to make up unearned employability points for **excused** absences only. Full credit will be given for assignments/tests that have been made up due to excused absences only (see Student Handbook).

Performance Grades (30% of final grade)

These grades will be based on evaluation of the student's shop performance. Grades will be derived by both the instructor and Student Personnel Organization's evaluation of the following criteria:

- Cooperation
- Neatness and Orderliness
- Initiative
- Workmanship
- Application and Industry
- Reliability
- Aptitude
- Safety

Test Grades (25% of final grade)

- Test grades will be based on a 100-point scale.
- Test grades include written and/or skills tests.
- A test will be given for each unit of instruction.
- Tests are to be taken as a unit is completed.
- Tests must be completed within allotted time.

Academic Grades (25% of final grade)

- Student Notebook

Final Grade (9 Weeks Period)

9-weeks grade will be calculated by averaging grades in each category and summing each category according to their assigned weight. Progress reports will be sent to home schools at six and twelve-week intervals each semester as required or requested. Grades are accessible on-line at http://sonisweb.greatplains.edu/studsect.cfm

Grading Scale:

The grading scale as adopted by the Board of Education is as follows:

A = 90 – 100
B = 80 – 89
C = 70 – 79
D = 60 – 69
F = Below 60
W = Withdrawn
I = Incomplete
N = No Grade (Refer to Student Handbook)

Make-Up Work Policy:
All Make-Up Work Is The Responsibility Of The Student. Make-up work will be handled as specified in the Student Handbook. Please be sure to read and understand all student policies, especially make-up of assignments, tests and employability due to absences. Students should always arrange for any make-up work with the instructor as per the Student Handbook. Students should keep track of his or her progress and grades.

Attendance Policy:
For specific information related to attendance and tardiness refer to the Student Handbook. Students should keep a written record of their absences and tardiness.

Course Requirements and Expectations:
The general course requirements and expectations include:

- Teaching methods consist of lecture and "hands-on" projects.
- The student must demonstrate the ability to apply safety to all aspects of the agriculture field.
- All students must adhere to the policies and procedures in the GPTC Student Handbook.
- It is highly recommended that the student have purchased or attained the required tools and equipment for employment as a technician. Possessing a valid driver's license will also benefit the student and is recommended.

Student Behavior Includes:

- Students will wear shoes that completely cover the feet, laced properly. Students will wear clear safety glasses at all times while in the shop environment. Clear prescription glasses will be permitted. Safety glasses may not be altered without the specific permission of the instructor.
- Shorts will not be permitted at any time. Full length pants are to be worn as this is a working environment. Tank tops or sleeveless shirts are not to be worn at any time. No piercing at all visible shall be worn at any time.

NOTE: For additional information or questions regarding the GPTC School policies and procedures, please refer to the Student Handbook and/or the Instructor.

Industry Alignments:

- John Deere, Case IH, and Procedure Standards for Industrial Certification of Farm Repair
- Automotive Service Excellence (ASE)
- Catapillar
- Claas
- New Holland
- CNH Global
- Macdon Corporation

Certification Outcomes:

Tier 1 – Certifications Recognized, Administered and/or Endorsed by Industry
- MHT: Electrical/Electronic Systems Student (ASE Student) (2261)

Tier 2 – Certifications Endorsed by Industry Organizations
- ODCTE: Electrical/Electronic Systems Repair Technician (2153)
- ODCTE: Preventive Maintenance Inspection Technician (2152)

Tier 7 – National Career Readiness Certificate in Applied Mathematics, Locating Information and Reading for Information:
- Platinum Level – 6 or above in all three areas

- Gold Level – 5 or above in all three areas
- Silver Level – 4 or above in all three areas
- Bronze Level – 3 or above in all three areas

CIP Code and SOC Code Crosswalk:

- CIP Code – 01.0205
- SOC Code – 49-3041.00

Instructional Materials:

High School Students are not required to purchase textbooks or supplemental materials.

Textbooks:

Deere, John. Hydraulic Principals. 0-86691-141-3. Davenport: Deere and Company Service Publications, 1992.

Deere, John. Engines. 0-86691-137-5. Davenport: Deere and Company Service Publications, 1991.

Deere, John. Electrical Systems. 0-86691-128-6. Davenport: Deere and Company Service Publications, 1991.

Jacobs, Clinton, and William Harrell. Agricultural/Power and Machinery. 0-07-032210-4. New York City: McGraw/Hill Publishing, 1983.

Jacobs, Clinton, and William Harrell. Agricultural/Power and Machinery Activity Guide. New York City: McGraw/Hill Publishing, 1983.

Toboldt, Bill. Diesel; Fundamental, Service, Repair. 0-87006-424-X. Tinley Park: Goodheart-Willcox Co., Inc., 1983.

Supplemental Materials:

"Power, Structural & Technical Systems Pathway." CEV Multimedia, Ltd., DVD-ROM. Lubbock, 2008.