Change in OHS Course Offerings

Rationale: Darren Knuth (industrial technology and welding teacher) will be retiring at the end of the school year. In collaboration with Chelsea Eden and John Heiser (Agricultural Education Program Advisor), I have created a plan to shift this position from tech only to an additional ag education position. The rationale for this is to still offer the construction and welding classes that Darren taught, but with an agriculture focus. As agriculture is an important and significant part of the economy in our school district, I feel this makes sense. In addition, if we increase the number of ag classes we offer, it will allow us to apply for more Three Circles and Agriculture in Education grant funds.

Course options for second teacher:

1. Intro Level course= Basic Ag Mechanics
2. Skill Based Course= Advanced Ag Mechanics, Ag Construction, Agricultural Welding, Agricultural Engine and Maintenance
3. Advanced Skill Courses= Advanced Agricultural Welding
4. Classes to rotate in: Agricultural Electrical Systems, Precision Ag, Agricultural Engineering

Course Descriptions:

Basic Ag Mechanics:

In this course, theory and hands-on experiences provide opportunities for students to develop basic knowledge and skills in agricultural mechanics. Instructional areas include the basic shop safety, hand and power tool knowledge, fasteners, basic fundamentals of maintaining and repairing small gasoline engines, basic electricity, basic plumbing, concrete, welding, construction, and operating agricultural equipment safely. Improving workplace and computer skills will be a focus. Participation in FFA student organization activities and Supervised Agricultural Experience (SAE) projects is an integral course component for leadership development, career exploration and reinforcement of academic concepts.

Advanced Ag Mechanics:

This course will concentrate on expanding student's knowledge and experiences with agricultural mechanics technologies utilized in the agricultural industry. Units of instruction included are: design, construction, fabrication, maintenance, welding, electricity/electronics, internal combustion engines, hydraulics, and employability skills. Careers of agricultural construction engineer, electrician, plumber, welder, equipment designer, parts manager, safety inspector, welder, and other related occupations will be examined. Improving workplace and computer skills will be a focus. Participation in FFA student organization activities and Supervised Agricultural Experience (SAE) projects is an integral course component for leadership development, career exploration and reinforcement of academic concepts.

Agricultural Construction

This advanced course focuses on the knowledge, hands-on skills, and workplace skills applicable to construction in the agricultural industry. Major units of instruction include: personal safety, hand tools, power tools, blueprint reading, surveying, construction skills in carpentry, plumbing, electricity, concrete, block laying, drywall and painting. Careers such as agricultural engineers, carpenter, plumber, electrician, concrete and block layers, finishers, safety specialists, and other related occupations will be examined. Improving workplace and computer skills will be a focus. Participation in FFA student organization activities and CAREER PROGRAMS IN AGRICULTURE, FOOD, AND NATURAL RESOURCES (AFNR) Supervised Agricultural Experience (SAE) projects is an integral course component for leadership development, career exploration and reinforcement of academic concepts.

Agricultural Welding:
This course will emphasize the development of basic welding and metalworking skills necessary to succeed in agricultural careers in the agricultural metal fabrication industry. Topics of instruction include: welding safety, metal identification and properties, joint design and terminology, metal preparation, use of oxy-acetylene torch, Stick Metal Arc Welding focusing on the Flat and Horizontal position, Gas metal arc welding (GMAW), and project design and construction. Suggested Electrode for this course is E6013 and E6011. Improving workplace and computer skills will be a focus. Participation in FFA student organization activities and Supervised Agricultural Experience (SAE) projects is an integral course component for leadership development, career exploration and reinforcement of academic concepts.

Agricultural Engineering
Throughout the course, students apply technical and engineering skills while becoming competent in the processes used to operate, repair, engineer, and design agricultural structures, engines, and equipment. Students practice technical skills including reading prints, troubleshooting machines, documenting an engine teardown and assembly, reading schematics, building simple machines, using hydraulics, researching machine replacement parts, and calculating production efficiencies. The engineering portion of the course includes prototype development, computer aided design (CAD), 3D printing, documentation of machine processes, machine automation and programming, testing designs for structural integrity, and calculating machine speed and power. Participation in FFA student organization activities and Supervised Agricultural Experience (SAE) projects is an integral course component for leadership development, career exploration and reinforcement of academic concepts

Agricultural Engine Maintenance
This course provides students with the opportunity to learn how to operate, service, and recondition agricultural power units, emphasizing two- and four-cycle small gasoline engines. This class will provide students with opportunities to troubleshoot and repair speed controls, lubrication, ignition, fuel, power transfer, cooling, exhaust, and starting systems; use hand, power, and overhaul tools; and read and interpret service manuals and parts' catalogs.

Additional units of instruction may include power transmission, electrical, and hydraulic/pneumatic systems. Applications may include lawn mowers, tractors, tillers, power tools, and so on. Improving workplace skills will be a focus in this course. Participation in FFA student organization activities and Supervised Agricultural Experience (SAE) projects is an integral course component for leadership development, career exploration and reinforcement of academic concepts.

Agricultural Electrical Systems:
This course provides a survey of the theory, terminology, equipment, and practical experience related to electrical applications in agricultural settings. This course typically CAREER PROGRAMS IN AGRICULTURE, FOOD, AND NATURAL RESOURCES (AFNR) includes the study of electrical safety, the National Electrical Code, AC and DC circuits, electrical wiring, electric motors and controls, and may cover such skills as those involved in diagramming and building circuits; wiring buildings; installing lighting fixtures, switches, and outlets; and estimating job costs. In this course, safety is stressed, and a career exploration component may be offered. Maintenance and repair skills are often included as course topics. Improving workplace skills will be a focus in this course. Participation in FFA student organization activities and Supervised Agricultural Experience (SAE) projects is an integral course component for leadership development, career exploration and reinforcement of academic concepts.

Advanced Agricultural Welding:
Agriculture Welding focuses on the development of advanced welding and metal fabrication techniques utilized within the agricultural industry. Topics of instruction may include welding safety, technical drawings & blueprint reading, welding symbols, welding discontinuities and failures, destructive testing, nondestructive examination, equipment setup, metal preparation, pipe welding, cutting processes, oxy-fuel cutting/welding, shielded metal arc welding, gas metal arc welding, flux cored arc welding, and gas tungsten arc welding processes. Suggested welding positions are Flat, Horizontal, Vertical down, and Vertical Up. Electrodes to use should include E6010, E6011 and E7018. This course should be aligned with an industry-recognized credential. Upon successful completion, it is suggested students receive an industry certification or dual-credit through a local accredited institution. Improving workplace skills will be a focus in this course. Participation in FFA student organization activities and Supervised Agricultural Experience (SAE) projects is an integral course component for leadership development, career exploration and reinforcement of academic concepts.

Precision Agriculture
Precision Agriculture courses provide a fundamental understanding of the principles of precision agriculture. Topics may include Global Positioning Systems (GPS); Geographical Information Systems (GIS); yield monitors; remote sensing; drones; grid soil sampling; variable rate application; digital image processing simulator (DIPS); Geodesy, automated cartography (Auto-Carto); land surveying (LS); navigation and guidance to effectively use data to make informed production management decisions. These courses may use spatial analysis models and guidelines for integrating, interpreting, analyzing, and synthesizing geographic data, with a focus on both the implications and limitations of such technologies. Participation in FFA student

organization activities and Supervised Agricultural Experience (SAE) projects is an integral course component for leadership development, career exploration and reinforcement of academic concepts.