Agricultural and Environmental Systems
Career Field Pathways and Course Structure

Courses in Agricultural & Industrial Power Technology (A1)

PATHWAY COURSES	SUBJECT CODE
Agriculture, Food and Natural Resources[1]	010105
Agricultural & Industrial Power[2]	010210
Electronic & Electrical Systems	010215
Engines and Fuel Systems	010220
Hydraulics and Pneumatics	010225
Outdoor Power Technology	010235
Power Sports	010240
Power Trains	010230
ELECTIVES	**SUBJECT CODE**
Business Management for Agricultural and Environmental Systems	010115
Agricultural and Environmental Systems Capstone[3]	010190
Communications and Leadership	010110

[1]First course in the Career Field; [2]First course in the Pathway; [3]Does not count as one of the required four courses

Agriculture, Food and Natural Resources
Subject Code: 010105
This is the first course in the Agricultural and Environmental Systems career field. It introduces students to the pathways that are offered in the Agricultural and Environmental Systems career field. As such, learners will obtain fundamental knowledge and skills in food science, natural resource management, animal science & management, plant & horticultural science, power technology and biotechnology. Students will be introduced to the FFA organization and begin development of their leadership ability.

Agricultural and Industrial Power
Subject Code: 010210
The A&I *Power* course will introduce students to the breadth of the Agricultural and Industrial Power Technology pathway. Students will learn the principles of agricultural and industrial power technology equipment systems including electronic, electrical, engines, fuel, hydraulics, and power trains. Additionally, students will learn to operate and maintain agricultural & industrial equipment.

Electronic and Electrical Systems
Subject Code: 010215
In the *Electronic and Electrical Systems* course, students will diagnose problems, test and repair electronic and electrical components. Students will learn physical principles of electricity and apply such to the proper maintenance, diagnosis and repair of electrical circuits. Students will learn the physical and mathematical principles of electronics, controllers and sensors and will learn the operation of onboard computers and programmable controllers.

Engines and Fuel Systems
Subject Code: 010220
In the *Engines & Fuel Systems* course, students will learn basic engine information and operations; different kinds of corollary systems; how to use test equipment and service tools; plus techniques for diagnosis and testing. Students will learn the different kinds of fuel systems, fuels and their characteristics, designations, and additives. Students will diagnose fuel system problems including the identification of parts failure and will be able to make necessary repairs.

Hydraulics and Pneumatics
Subject Code: 010225
In the *Hydraulics and Pneumatics* course, students will learn physical principles of hydraulics. They will diagnose problems, test system components, learn how to properly maintain hydraulic circuits and diagnose and test problem areas in hydraulics systems of agricultural and industrial power equipment.

Outdoor Power Technology
Subject Code: 010235
The *Outdoor Power Technology* course trains students in technical knowledge and skills necessary to maintain, troubleshoot and repair small power equipment used in agriculture, horticulture and natural resource management. Students will learn the theory of power and progress through aspects of 2- and 4-stroke engines, electrical systems, fuel systems, and drive train systems that make up modern small engine powered equipment.

Power Sports
Subject Code: 010240
In the *Power Sports* course, students will learn the theories of operating systems and the maintenance practices for power sport vehicles used off road or on the water. Students will learn principles of power sports vehicles including diagnosis, service, and repair. This courses covers core information on power sport internal combustion engines, primary drive operation, transmission power flow, fuel system operation, and electrical and suspension systems.

Power Trains
Subject Code: 010230
In the *Power Trains* course, students will learn the physical principles of power trains, the different components that transfer and control power, and how power trains are designed to function. Students will also learn how to adjust and maintain a power train system as well as how to diagnose and test problem areas.

Business Management for Agricultural and Environmental Systems
Subject Code: 010115
Learners will examine elements of business, identify organizational structures and identify and apply management skills. Learners will develop business plans, financial reports and strategic goals for new ventures or existing businesses. Learners will use marketing concepts to evaluate the marketing environment and develop a marketing plan with marketing channels, product approaches, promotion and pricing strategies. Learners will practice customer sales techniques and apply concepts of ethics and professionalism while understanding related business regulations.

Agricultural and Environmental Systems Capstone
Subject Code: 010190
The capstone course is an opportunity for students to solve problems and demonstrate that they have achieved the requisite knowledge and skills in their chosen pathway within the Agricultural and Environmental Systems career field. The course is designed to assess cognitive, affective and psychomotor learning and to do so in a student-centered and student-directed manner that requires the command, analysis and synthesis of knowledge and skills. The capstone requires the application of learning to a project that serves as an instrument of evaluation.

Communications and Leadership

Subject Code: 010110

Students will analyze attributes and capabilities of those in leadership positions and develop their communication and leadership skills in authentic situations. The course prepares students to apply journalistic, communication and broadcasting principles to the development, production, and transmittal of agricultural and environmental systems information.