CareerClusters® PATHWAYS TO COLLEGE & CAREER READINESS
Agriculture, Food & Natural Resources

Learning that works for Colorado CTE®

Colorado AFNR Course Scope and Sequence

Course Name	**Ag. Engine & Equipment Technology A**	**Course Details** **Course = 0.50 Carnegie Unit Credit**	Level 4 course in the Power, Structure, & Technology pathway. This course aligns with any of the three strands.
Course Description	The Applied Agriculture Technology course provides students with the opportunity to focus on topic areas related to the use of technology in agriculture, applying technological proceses to solve real problems and developing knowledge and skills to design, modify, use, and apply technology appropriately. Students may design and assemble projects and learn to work with different digital applications to complete tasks as seen in the agriculture industry.		
Note:	This is a suggested scope and sequence for the course content. The content will work with any textbook or instructional resource. If locally adapted, make sure all essential knowledge and skills are covered.		
SCED Identification #	18499	Schedule calculation based on 60% of a semester instructional time. Scope and sequence allows for additional time for guest speakers, student presentations, field trips, remediation, or other content topics.	

All courses taught in an approved CTE program must include Essential Skills embedded into the course content. The Essential Skills Framework for this course can be found at **https://www.cde.state.co.us/standardsandinstruction/essentialskills**

Unit Number, Title and Brief Description	Suggested % of Instructional Time	CTE or Academic Standard Alignment	Competency / Performance Indicator	Outcome / Measurement	CTSO Integration
Unit 1: CAD/CAM Design Softward	10%	**PST.05**. Use control, monitoring, geospatial and other technologies in AFNR power, structural and technical systems.	**PST.05.01.** Apply computer and other technologies (e.g., robotics, CNC, UAS, etc.) to solve problems and increase the efficiency of AFNR systems. *SCIENCE: NGSS.ETS.1.3 SC.HS.3.9*	**PST.05.01.01.a**. Research and categorize computer technologies used to solve problems and increase efficiency in AFNR systems.	
Unit 2: CNC Applications • Plasma • Router • Laser & Additive Manufacturing processes	12%	**PST.05.** Use control, monitoring, geospatial and other technologies in AFNR power, structural and technical systems.	**PST.05.01.** Apply computer and other technologies (e.g., robotics, CNC, UAS, etc.) to solve problems and increase the efficiency of AFNR systems. *SCIENCE: NGSS.ETS.1.3 SC.HS.3.9*	**PST.05.01.02.a.** Examine and summarize the specific intent of technologies used to solve problems and increase the efficiency of AFNR systems (e.g., robotics, UAS, CNC, etc.).	
Unit 3: Arduino Applications & Programming	5%	**PST.05.** Use control, monitoring, geospatial and other technologies in AFNR	**PST.05.01.** Apply computer and other technologies (e.g., robotics, CNC, UAS, etc.) to solve problems and	**PST.05.01.01.a.** Research and categorize computer technologies used to solve problems and increase	

		power, structural and technical systems.	increase the efficiency of AFNR systems. *SCIENCE: NGSS.ETS.1.3 SC.HS.3.9*	efficiency in AFNR systems.	
Unit 4: Remote Sensing Device, Components, DC & Data Circuits	10%	**PST.05.** Use control, monitoring, geospatial and other technologies in AFNR power, structural and technical systems.	**PST.05.01.** Apply computer and other technologies (e.g., robotics, CNC, UAS, etc.) to solve problems and increase the efficiency of AFNR systems. *SCIENCE: NGSS.ETS.1.3 SC.HS.3.9*	**PST.05.01.02.a**. Examine and summarize the specific intent of technologies used to solve problems and increase the efficiency of AFNR systems (e.g., robotics, UAS, CNC, etc.).	
Unit 5: GIS & GPS technology systems and Applications	7%	**PST.05.** Use control, monitoring, geospatial and other technologies in AFNR power, structural and technical systems.	**PST.05.03.** Apply geospatial technologies to solve problems and increase the efficiency of AFNR systems.	**PST.05.03.01.a.** Research and summarize the impact of utilizing geospatial technologies (i.e., GPS, GIS, remote sensing, telematics, etc.) in AFNR systems.	
Unit 6: Drone & AV Technology Applications • IR sensing	3%	**PST.05.** Use control, monitoring, geospatial and other technologies in AFNR power, structural and technical systems.	**PST.05.01.** Apply computer and other technologies (e.g., robotics, CNC, UAS, etc.) to solve problems and increase the efficiency of AFNR systems. *SCIENCE: NGSS.ETS.1.3 SC.HS.3.9*	**PST.05.01.01.b.** Analyze data using computer programs and other current technologies used in AFNR systems.	
Unit 7: RFID, Cellular, WiFi technology application/animal & Plant ID and Data Collection	3%	**PST.05.** Use control, monitoring, geospatial and other technologies in AFNR power, structural and technical systems.	**PST.05.02.** Prepare and/or use electrical drawings to design, install and troubleshoot electronic control systems in AFNR settings.	**PST.05.02.01.a.** Examine and summarize the specific intent of technologies used to solve problems and increase the efficiency of AFNR systems (e.g., robotics, UAS, CNC, etc.).	
Unit 8: Robotics Application in Manufacturing, animal production, greenhouse, Servo motors, controls	11%	**PST.05.** Use control, monitoring, geospatial and other technologies in AFNR power, structural and technical systems.	**PST.05.01.** Apply computer and other technologies (e.g., robotics, CNC, UAS, etc.) to solve problems and increase the efficiency of AFNR systems. *SCIENCE: NGSS.ETS.1.3 SC.HS.3.9*	**PST.05.01.02.a.** Examine and summarize the specific intent of technologies used to solve problems and increase the efficiency of AFNR systems (e.g., robotics, UAS, CNC, etc.	

CAS Academic Standards Alignment: Online Version: https://www.cde.state.co.us/apps/standards/**;** Download version: https://www.cde.state.co.us/apps/standards/

Science:

- NGSS.SC.HS.ETS.1.3 – Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.
- SC.HS.3.9 - Resource availability has guided the development of human society and use of natural resources has associated costs, risks, and benefits.

Essential Skills:

Problem Solver:

- Critical Thinking and Analysis: The ability to apply a deliberate process of identifying problems, gathering information, and weighing possible solutions, including: making choices rooted in understanding patterns, cause-and-effect relationships, and the impacts that a decision can have on the individual and others.
- Creativity and innovation: the ability to demonstrate curiosity and imagination through experimenting with new and emerging ideas.

Empowered Individual:

- Self-Awareness: the ability to understand one's own emotions, thoughts, and values, and how personal actions and emotions influence behavior across contexts, including: the capacity to recognize one's strength and limitations with a well-grounded sense of confidence and purpose.