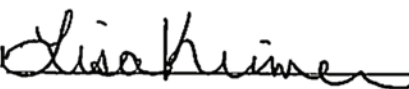# New Program Request Form

CA1

General Information

Institution submitting proposal	Flint Hills Technical College
Name, title, phone, and email of person submitting the application (*contact person for the approval process*)	Kim Dhority, Dean of Academic Affairs 620.341.1345 kdhority@fhtc.edu
Identify the person responsible for oversight of the proposed program	Kim Dhority, Dean of Academic Affairs
Title of proposed program	Precision Agriculture Technology
Method of program delivery (face to face, online, hybrid)	All three
Proposed suggested Classification of Instructional Program (CIP) Code	01.1102 Agronomy and Crop Science
CIP code description (from nces.ed.gov/ipeds)	A program that focuses on the chemical, physical, and biological relationships of crops and the soils nurturing them. Includes instruction in the growth and behavior of agricultural crops, the development of new plant varieties, and the scientific management of soils and nutrients for maximum plant nutrition, health, and productivity.
Standard Occupation Code (SOC) associated to the proposed CIP code	11-9013.00 Farmers, Ranchers, and other Agriculture Managers (TCB) 19-4012.**01** Precision Agriculture Technicians (AAS)
SOC description (from onetonline.org)	11-9013.00 Farmers, Ranchers, and other Agriculture Managers. Occupation Description (O*Net) Plan, direct, or coordinate the management or operation of farms, ranches, greenhouses, aquacultural operations, nurseries, timber tracts, or other agricultural establishments. May hire, train, and supervise farm workers or contract for services to carry out the day-to-day activities of the managed operation. May engage in or supervise planting, cultivating, harvesting, and financial and marketing activities. CERTB training 19-4012.**01** Precision Agriculture Technicians Occupation Description (O*Net) Apply geospatial technologies, including geographic information systems (GIS) and Global Positioning System (GPS), to

	agricultural production or management activities, such as pest scouting, site-specific pesticide application, yield mapping, or variable-rate irrigation. May use computers to develop or analyze maps or remote sensing images to compare physical topography with data on soils, fertilizer, pests, or weather. AAS Degree
Number of credits for the degree <u>and</u> all certificates requested	30 Credit Hours- Technical Certificate B 61-62 Credit Hours- Associate of Applied Science
Proposed Date of Initiation	August, 2025

Specialty program accrediting agency	None
Industry-recognized certification(s) to be earned by students	Potential: Private Pesticide Applicators (for those under 18) Commercial Pesticide Applicators (for those over 18) Remote Pilot License (Drone)

Signature of College Official _Lisa Kime_____ Date_7/1/2024_

Signature of KBOR Official_____ Date_____

Narrative

Completely address each one of the following items for new program requests. Provide any pertinent supporting documents in the form of appendices, (i.e., minutes of meetings, industry support letters, CA-1a form).

Institutions requesting subordinate credentials need only submit the following sections:
1) General Information, 2) Program Rationale, 3) Complete catalog descriptions (including program objectives) for the proposed program, 4) List by prefix, number, title, and description all courses (including prerequisites) to be required or elective in the proposed program, 5) List any pertinent program accreditation available (rationale for seeking or not seeking accreditation and plan to achieve accreditation), and 6) Program Approval at the Institution Level.

Program Rationale

- *Provide an overall explanation and background surrounding the development of the proposed program. Include why the program is needed, where the idea to offer the program came from (including the requesting entity), the number of projected enrollments, and who was involved in the development of the program.*

Discussions with area implement dealers and local stakeholders have been ongoing for the last seven years about developing agricultural programming at Flint Hills Technical College. Forward momentum on this development was hindered by space, resources, and prioritization of skills/curriculum needed. In the spring of 2022, FHTC brought together area farmers, implement dealers, agricultural teachers, and other agricultural representatives to narrow down the most in-demand skills and knowledge. Through those discussions, a targeted precision agriculture program curriculum was outlined that would provide the core skills needed by both industry and private sector employers.

The Precision Agriculture positions are essential to workforce development in rural areas around Kansas. Combining needed skills training to leverage technology and optimize field-level management of agricultural production is essential to address the most pressing concerns in the agricultural field. A well-developed training program will build the foundational knowledge required to address increasing food demands, resource management issues, and environmental sustainability.

As Flint Hills Technical College (FHTC) began looking into CIP and SOC codes for this program, it was apparent that this is a new field of study greatly needed in Kansas. The SOC code that most closely aligns to the program for which we are providing training is SOC 19-4012.01 which is Precision Agriculture Technicians. The CIP code that most closely aligns with this occupational code is CIP code 01.1102 Agronomy and Crop Science. Data from the 10-Year Occupational Outlook 2022-2032 is summarized below along with other information.

Occupational projected increase per 10-year occupational outlook 2022-2032	19-4012.01 projected increase	6.4%
	Statewide projected increase for SOC 19-0000 group	7.6%
	Statewide projected increase for all occupations	3.3%
Typical Education needed for entry for 19-4012.01	Associate degree (2022-2032 Occupational Outlook. It also indicates Associates degree in the Department of Labor information.	

Industry-recognized certifications	There are industry-recognized certifications built into this program. These certifications are not required but do build on qualifications and pay. These potential certifications are Private Pesticide Applicators (for those under 18), Commercial Pesticide Applicators (for those over 18), Remote Pilot License (Drone)	
CIP matches to SOC 11-9013 (CERTB)	Best fit of all CIP codes for SOC 19-4012.01 (AAS)	
Projected Hiring for AAS level of education	Modern Ag inc.	1-2 per year
	Prairieland Partners (John Deere)	2-4 per year
	KanEquip	2 current positions, 1-2 per year
	When doing a search of the Kansas Department of Labor site on July 23, 2024	Showed 87 Listings for Precision Ag Technicians
Wage Information	Annual Average wage (10-year outlook) 19-4012	$45,950
	Median wage threshold, 2023 High Demand	$41,870
CLNA Information	CLNA information included below. On the first two CLNA's that data showed a need for several agriculture areas. Business and industry kept encouraging the Precision Ag route. To gain more insight, an Ag summit was held between the first two CLNA timeframes due to business needs	

While the occupation of Precision Agriculture Technician did not meet the requirements for the 2023 High Demand Listing from the Kansas Department of Labor, the percentage increase in the 10-year outlook is twice that of the state average. The occupation does require an Associate's degree level of education, three of our employers were polled and indicated a need of four to eight positions per year, and the annual average wage would have likely placed the occupation as a High Wage occupation. FHTC would request to reinstate CIP Code 01.1102 Agronomy and Crop Science to technical funded status which would make this program eligible for Perkins funding.

Program Advisory Members were identified that represent a cross-section of agricultural stakeholders in the FHTC service region. PAC members met in March of 2024 to review the curriculum and degree plan draft documents. FHTC hired Dr. Kelly Hoelting to serve as a consultant on curriculum development and advise on program facilities and resource needs. Dr. Hoelting, Kim Dhority (Dean of Academic Affairs), and Denise Gilligan (Dir. of Institutional Effectiveness) worked cooperatively to finalize the curriculum documents for the formal review and approval process.

Dr. Hoelting, Kim Dhority, and Mike Crouch (V.P. of Advancement) worked collaboratively to establish prioritized resources to meet the needs of the program. This included looking at space and facilities. The program anticipates an on-campus entry class of 15-25 in the first semester of the

offering. The program is anticipated to be able to serve 50-75 students through on-campus programming offered on weekdays and evenings. The program may be able to serve additional students through approved dual/concurrent enrollment courses at area high schools.

- *If the recommended program is duplicative of other programs in the area, please specifically address why the new, additional program is necessary.*

Although there are other Precision Agricultural Programs in Kansas, there are no other programs in the Flint Hills Technical College service area or Perkins region. FHTC business partners have been very adamant that there is a need for this program in the college' service area. This point is validated by several of the letters of support that FHTC has received from businesses.

According to JobsEQ programs in Kansas that link to Agriculture Technicians include:

Postsecondary Programs Linked to Agricultural Technicians

Program	Awards
Fort Hays State University	
Agriculture, General	41
Biology/Biological Sciences, General	54
Kansas State University	
Agronomy and Crop Science	38
Animal Sciences, General	260
Biology/Biological Sciences, General	83
Food Science	64
Pittsburg State University	
Biology/Biological Sciences, General	53
University of Kansas	
Biology/Biological Sciences, General	81
University of Saint Mary	
Biology/Biological Sciences, General	28
Wichita State University	
Biology/Biological Sciences, General	60

Program Description and Requirements
- *Provide a complete catalog description (including program objectives/outcomes) for the proposed program.*

Precision Agriculture Course Descriptions
Program Mission:
The Precision Agriculture Program will develop the skills to revolutionize agricultural practices through the innovative application of technology, data analytics, and sustainable practices, maximizing efficiency, productivity, and environmental stewardship for global agriculture, food, fiber, and natural resource systems.

PROGRAM LEVEL OUTCOMES: Technical Certificate
- TC 1 Students will collect, analyze, and interpret agricultural data using precision technologies to make informed decisions.
- TC 2 Students will investigate crop management techniques while applying environmental best management practices (BMP).

- TC 3 Students will operate, diagnose equipment issues, and perform routine maintenance tasks to ensure optimal performance of precision agriculture equipment.
- TC 4 Students will understand how to integrate precision agriculture technologies into overall agricultural operations to maximize efficiency and profitability.
- TC 5 Students will implement strategies to reduce chemical usage, conserve water resources, and promote soil health and biodiversity.

Associate Degree

- AAS 1 Students will interpret data to identify trends, make predictions, and optimize agricultural management practices for improved productivity and sustainability.
- AAS 2 Students will work collaboratively to solve complex agricultural challenges.
- AAS 3 Students will understand the importance of ethical behavior in their interactions with clients, colleagues, and the agricultural community.
- AAS 4 Students will apply precision agriculture principles to diverse scenarios, spanning commercial enterprises and private ventures.

- *Include any work-based learning requirements of the program, such as clinicals, internships, etc. If clinical experience is required, please identify whether sufficient clinical sites are available.*

AG 271 Internship (3 credit hours) Internship (135 hrs)
Ag Internship provides students the knowledge and skills for various Agriculture Careers. Students will provide a detailed log of experiences and hours at an approved agricultural partnership. Internships can be in an industrial, professional, or private setting with direct on-site supervision from an experienced agricultural professional.
1. Identify career opportunities for Precision Agriculture.
2. Identify and develop a training plan to include five specific, measurable intended outcomes for the placement/internship opportunity.
3. Maintain and submit all required records and documentation throughout placement/internship.
4. Follow all recommended safety processes consistently and effectively.
5. Develop employable personality traits, attitudes, work habits, and communication skills essential for success on the job.
6. Understand industry standards and requirements.
7. Demonstrate ability to work with others.
8. Demonstrate punctuality and dependability by being at work when required.

- *List and describe the admission <u>and</u> graduation requirements for the proposed program.*

Policy 6.00: ENTRANCE
Students making application to Flint Hills Technical College must complete an Application for Admission and have graduated from high school or received a General Education Development (GED) Diploma. In addition, high school juniors and seniors may concurrently enroll at Flint Hills Technical College.
Post-secondary students are responsible for providing Flint Hills Technical College with all educational records including an official high school transcript or an official transcript of GED completion, ACT scores and College transcripts. Students must provide the necessary transcript documents prior to being placed in enrolled status. In addition, students completing a Spanish GED will be required to take the TOEFEL to assess English proficiency.
All applicants for admission to a program of study will be required to meet the College's admissions standards, which include taking standardized assessments. Students are required to meet the minimal "ability-to-benefit" level as determined by the United States Department of Education.
The student must satisfy all financial responsibilities to Flint Hills Technical College.
 This includes tuition, fees, cost of books and tools, and any other costs required by the College. To be considered successfully matriculated, a student must have met all of the above requirements. Failure to do so will result in the student not being accepted to Flint Hills Technical College.
> **ENTRANCE PROCEDURE**
> College transcripts are to be sent directly from the transferring institution to FHTC, c/o Dean of Enrollment Management.

Assessment tests will be scheduled throughout the year. Flint Hills Technical College utilizes the ACT ASSET test as its standardized entrance exam. In lieu of the assessment test, students can submit their ACT scores for consideration. Students who do not satisfy the assessment score requirements can retest up to two times and may appeal to the Standards Waiver Committee in writing. The Standards Waiver Committee consists of the EVP of Student Services & Academic Affairs and the appropriate Division Chairperson.

Some Flint Hills Technical College programs may impose additional admission requirements as prerequisites to acceptance. These requirements are determined at the Division level and information will be made available to interested students at the time of application or upon request.

Policy 6.04 ASSOCIATE OF APPLIED SCIENCE DEGREE
An Associate of Applied Science degree is earned when a student completes a minimum of 60 credit hours and has a cumulative grade point average (GPA) of 2.0 or higher. A minimum of 44 credit hours of technical education coursework and a minimum of 16 credit hours of general education coursework are required to earn an Associate of Applied Science degree.

Policy 6.05 TECHNICAL CERTIFICATE
A technical certificate is earned when a student completes the minimum number of hours and courses required in the freshman year of a program of study, which awards a technical certificate. The student must have completed such coursework with a grade point average (GPA) of 2.0 or higher.

Policy 5.13 GRADUATION and COMMENCEMENT
For a student to be eligible to be designated a graduate and receive a degree from Flint Hills Technical College:
1. The student must complete completion all certificate or degree requirements and
2. The Student must complete an application for Graduation

For a student to participate in commencement ceremonies, all of the above requirements must be met and/or:
1. Summer graduation candidates must be within nine hours of program completion and enrolled in the courses necessary for completion; or
2. AAS candidates who have completed all of their technical education courses and are within one general education course of degree completion shall be [delete and] and pre-enrolled in the course needed to complete the degree.
3. Students must adhere to specified procedures related to commencement activities.

Demand for the Program
- *Using the most recent Kansas Department of Labor's Long Term (10-year) Occupational Outlook, (https://klic.dol.ks.gov) identify employment trends and projections for the SOC code identified in the General Information section: annual occupational growth, estimated annual median wages, and typical education level needed for entry.*
    - *Labor information included should show demand in the occupation for the level of education being proposed for the program.*
    - *Include additional data for local and regional employer demand if available.*
    - *For new programs for which state-level labor data is not yet available, additional resources to demonstrate demand for the occupation being trained must be included. Job posting data (cite resource used and date of review) and projected hiring needs for employers (documented in employer letters of support) are examples of additional labor data documentation.*

19-4012.01 Precision Agriculture Technicians
Apply geospatial technologies, including geographic information systems (GIS) and Global Positioning System (GPS), to agricultural production or management activities, such as pest scouting, site-specific pesticide application, yield mapping, or variable-rate irrigation. May use computers to develop or analyze maps or remote sensing images to compare physical topography with data on soils, fertilizer, pests, or weather.

2022-2032 Regional Projection for Kansas (This information is for Agriculture Technician)
- Kansas Mean Wage: Kansas $45,950 average salary
- SE Region Mean Wage: Kansas has no reported information in this SOC Code
- Projected Jobs in Kansas: 349 openings with a projected growth of 6.1%
- Projected Jobs in SE Region: Kansas has no reported information in this SOC Code
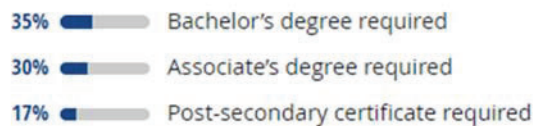
2023-2025 Regional Projection for Kansas
- Kansas Mean Wage: $50,140
- SE Region Mean Wage: Marked as confidential data.
- Projected Jobs in Kansas 337 increasing 334 projected growth of 2.1%.
- Projected Jobs in SE Region: Marked as confidential data.

O'Net Data Pulled 4/30/2024
- Kansas **Average** Wage: $42,670
- US **Average** Wage: $43,180
- Projected Jobs in Kansas: 540 increasing to 590 by 2030. This is a projected growth of 9% with annual job openings of 80 per year.
- Projected Jobs in US: 17,600 increasing to 18,400 by 2032. This is a projected growth of 5% with annual job openings of 2500 per year.

Education

How much education does a new hire need to perform a job in this occupation? Respondents said:

- 35% Bachelor's degree required
- 30% Associate's degree required
- 17% Post-secondary certificate required

JobsEQ

Online job ads are a timely indicator of local demand. Occupation assignments shown below are made by Chmura based upon analysis of job titles and job descriptions. Top employers and listed job requirements are shown on the following pages.

Occupations

SOC	Occupation	Active Job Ads
19-4012.00	Agricultural Technicians	55
19-4012.01	Precision Agriculture Technicians	34

- **Average** Wage: $50,500
- Education Profile for the position as Associate's degree with some on-the-job training

11-9013.00 Farmers, Ranchers, and Other Agricultural Managers
Plan, direct, or coordinate the management or operation of farms, ranches, greenhouses, aquacultural operations, nurseries, timber tracts, or other agricultural establishments. May hire, train, and supervise farm workers or contract for services to carry out the day-to-day activities of the managed operation. May engage in or supervise planting, cultivating, harvesting, and financial and marketing activities.

2022-2032 Regional Projection for Kansas
- Kansas Mean Wage: $71,010
- SE Region Mean Wage: Marked as confidential data

- Projected Jobs in Kansas are 7,985 increasing 8,687 by 2030. This is a projected growth of 8.8%.
- Projected Jobs in SE Region are 472 increasing to 547 by 2030. This is a projected growth rate of 15.9%.

O'Net Data Pulled 4/30/2024
- Kansas **Average** Wage: $76,570
- US **Average** Wage: $83,770
- Projected Jobs in Kansas: 7,990 increasing to 8,670 by 2030. This is a projected growth of 9% with annual job openings of 80 per year.
- Projected Jobs in US: 922,900 increasing to 880,600 by 2032. This is a projected growth of -5% with annual job openings of 88,800 per year.

JobsEQ

Online job ads are a timely indicator of local demand. Occupation assignments shown below are made by Chmura based upon analysis of job titles and job descriptions. Top employers and listed job requirements are shown on the following pages.

Occupations

SOC	Occupation	Active Job Ads	
11-9013.00	Farmers, Ranchers, and Other Agricultural Managers	57	

- **Average** Wage: $75,900
- **Education & Training** is primarily reported as previous experience
- *Show demand from the local community. Provide letters of support from at least three potential employers in your region, which state the specific type of support they will provide to the proposed program. Examples of program supports may include commitments to interview graduates for job positions, providing scholarships, providing internships or other work-based learning opportunities, donation of equipment/materials, assistance with program design, serving on advisory board, etc.*

    See Appendix A.

- *Provide data from the most recent Perkins Comprehensive Local Needs Assessment recommendations, demonstrating the need for the program initiation.*
    - On page 14 of the Region 5 Comprehensive local needs assessment it lists Precision Agriculture as a + 9.3% for Kansas growth.
    - The CLNA also documents other information relating to the Precision Agriculture Program of the need in the area. FHTC held an Ag Summit February 2022 to discuss the needs of the agriculture industry in FHTC's region. There were over 50 invitations sent out to business and industry and education groups to attend this summit. Besides FHTC employees we have 36 attendees. These attendees were from equipment dealers, county and city commissioners, government agencies, farmers and educational people. At the summit the attendees were divided into tables (be careful to be sure every industry was represented at each table if possible) and given five questions to discuss. The five questions were:
        - What are the skills actually needed to be learned?
        - Who needs to learn these skills?

- How many employees are needed with these skill sets?
- Where do you see this in five years?
- How does it relate to current industries?

Information was kept in a Padlet and then was ordered into categories. From that information, FHTC determined that Precision Ag was an area that was in high need for their region. The Program Advisory Committee for this program was selected based on the attendees of this summit.

- *Describe/explain any business/industry partnerships specific to the proposed program.*
  If a formal partnership agreement exists, agreement explaining the relationship between partners and documenting support to be provided for the proposed program must be submitted to the Board office independent from the CA1 materials for review purposes. The agreement will not be published or posted during the comment period.

  FHTC does not have any formal partnership agreements at this time for this program. The demand for this program was brought to the attention of FHTC by the implement dealers in the area and is reinforced by the farming community as the need for this area. When doing a search on the Kansas Department of Labor for Precision Ag Technician, 87 listings were located for everything from equipment dealerships, spraying businesses, and others. Farmers is another area where there is a need for this skill set. The minutes of the original PAC committee along with the minutes from the implement dealer meeting provide evidence of support from the community for resources and other information.

  Since the planning process for this program has started, other industry representatives in conversation with FHTC Foundation have indicated possible cross application of skill sets that may be able to be hired by their businesses. Those businesses include chemical spraying companies, road construction companies, and other businesses using the GPS systems.

*Duplication of Existing Programs

- *Identify similar programs in the state based on CIP code, title, and/or content. For each similar program provide the most recent K-TIP data: name of institution, program title, number of declared majors, number of program graduates, number of graduates exiting the system and employed, and annual median wage for graduates existing the system and employed.*

  CIP Code 01.1102
  The Precision Agriculture industry is a rapidly emerging field. In collaboration with the Kansas Board of Regents personnel to identify the appropriate CIP and SOC codes for the program, it became evident that the information is still evolving. While other colleges list different CIP codes, FHTC believes they are still comparable. These colleges are not within FHTC's region or service area.

Fice ID	Institution Name	Program Title	Program Code	Award Level	Award	CIP Code	Status	Req Hours	Year	Program Review Year	Distance Ed
008244	Johnson County Community College	SUSTAINABLE AGRICULTURE	5290	CERTA	CERT	01.0308	A	29	2024	Y	N
K00100	Northwest Kansas Technical College	PRECISION AGRICULTURE TECHNOLOGY	AG	CERTB	CERT	01.0308	A	35	2024	Y	N
K00100	Northwest Kansas Technical College	PRECISION AGRICULTURE TECHNOLOGY	AG	ASSOC	AAS	01.0308	A	68	2024	Y	N
K00100	Northwest Kansas Technical College	PRECISION AGRICULTURE TECHNOLOGY	AG	CERTA	CERT	01.0308	A	20	2024	Y	N
001921	Highland Community College	PRECISION AGRICULTURE	PAG	ASSOC	AAS	01.0308	A	61	2024	Y	Y
001921	Highland Community College	PRECISION AGRICULTURE	PAG	CERTB	CERT	01.0308	A	34	2024	Y	Y

Fice ID	Institution Name	Program Title	Program Code	Award Level	Award	CIP Code	Status	Req Hours	Year	Program Review Year	Distance Ed
001902	Cowley Community College	PRECISION AGRICULTURE_CERTB	PREC_AG	CERTB	CERT	01.0301	A	34	2024	C	N
001902	Cowley Community College	PRECISION AGRICULTURE_AAS	PREC_AG	ASSOC	AAS	01.0301	A	65	2024	C	N
001902	Cowley Community College	PRECISION AGRICULTURE_CERTC	PREC_AG	CERTC	CERT	01.0301	A	50	2024	C	N
001902	Cowley Community College	PRECISION AGRICULTURE_CERTA	PREC_AG	CERTA	CERT	01.0301	A	18	2024	C	N
001919	Garden City Community College	AGRIBUSINESS SPECIALIST	AGRI	CERTA	CERT	01.0301	A	17	2024	Y	N
001909	Cloud County Community College	AGRICULTURE PRODUCTION AND SERVICES	AGPROD	ASSOC	AAS	01.0301	A	62	2024	Y	N
001909	Cloud County Community College	AGRICULTURE PRODUCTION & SERVICES	AGPROD	CERTC	CERT	01.0301	A	45	2024	Y	N
001919	Garden City Community College	PRODUCTION AGRICULTURE	AGRI	ASSOC	AAS	01.0301	A	64	2024	Y	N
001909	Cloud County Community College	AGRICULTURE PRODUCTION AND SERVICES	AGPROD	CERTA	CERT	01.0301	A	16	2024	Y	N
001909	Cloud County Community College	PRODUCTION AGRICULTURE	AGPROD	CERTB	CERT	01.0301	A	30	2024	Y	N
001919	Garden City Community College	AGRIBUSINESS SPECIALIST - LIVESTOCK MANAGEMENT	AGLV	CERTB	CERT	01.0301	A	32	2024	Y	N
001919	Garden City Community College	PRODUCTION AGRICULTURE	AGRI2025	CERTB	CERT	01.0301	A	31	2025	Y	N
001919	Garden City Community College	PRODUCTION AGRICULTURE	AGRI2025	ASSOC	AAS	01.0301	A	60	2025	Y	N
001919	Garden City Community College	CROP PRODUCTION TECHNOLOGY	CROP	CERTC	CERT	01.0301	A	47	2025	C	N
001919	Garden City Community College	PRODUCTION AGRICULTURE	AGRI2025	CERTA	CERT	01.0301	A	17	2025	Y	N

- *Was collaboration with similar programs pursued? Please explain the collaboration attempt, and if not pursued, rationale for why collaboration was not a viable option. (Recommend that collaboration opportunities be explored and documented with existing programs, examples include sharing best practices, recruitment and retention strategies, curriculum or equipment suggestions, working with business and industry on work-based learning opportunities, etc.)*

Kim Dhority, Dean of Academic Affairs, visited with the agriculture programs at Highland Community College and Cowley County Community College. Both of these institutions have similar programs. Both of these representatives sent information to help with curriculum development. Mike Crouch, Vice-President of Advancement, visited with Northwest Technical College about facility information. All of these programs are outside of the FHTC service area and meetings with businesses involved further justified there was a need for this program.

FHTC already has articulation agreements with several Kansas regents' universities that allow students to pursue a bachelor's degree after receiving a FHTC associates degree. Program Advisory discussion indicates a desire to open dialogue with Kansas State University for a specific 2+2 Precision Agriculture Pathway. Curriculum decisions were made with the goal of aligning program of studies of agriculture.

Program Information

- *If the program has undergone the alignment process at the state level, please review alignment requirements and ensure the courses, industry-recognized certifications, and accreditation requirements are met in the proposal. Listing of aligned programs can be found at: https://www.kansasregents.org/workforce_development/program-alignment*
  Not applicable
- *List by prefix, number, title, and catalog description all courses (including prerequisites) to be required or elective in the proposed program.*

AG 101 Intro to Precision Agriculture (1 credit hour) Lecture/Project (37.5 hrs)
Introduction to precision agriculture, including history, applications, terminology, data management, and software. Exploration of precision agriculture career opportunities.
1. Explain precision agriculture's principles and historical development, including its evolution, key milestones, and technological advancements.
2. Analyze the significance of precision agriculture in improving agricultural efficiency, productivity, and sustainability.

3.   Identify and describe the various applications of precision agriculture technologies, such as GPS/GNSS guidance systems, remote sensing, variable rate technology, and drones.
4.   Evaluate software tools commonly used in precision agriculture, such as Geographic Information Systems (GIS), farm management software, and data analysis platforms.
5.   Explore career pathways and opportunities in precision agriculture, including roles in farm management, agronomy, agricultural engineering, data analysis, and technology development.

AG 102 Agricultural Computer Applications (3 credit hours) Lecture (37.5 hrs)

Introduction to computer hardware, platform environments, file manipulation, printers, and word processing, electronic presentations and communications, graphics, spreadsheet, and database management software; solution of agriculture data-related problems and use of prepared software and templates.

1.   Identify and describe basic components of computer hardware, operating systems, file management, storage, and output accessories.
   a.   Hardware such as CPU, memory, storage devices, and peripherals.
   b.   Utilize various operating systems and platform environments commonly used in agriculture, such as Windows, macOS, and Linux.
   c.   File management tasks may include creating, organizing, copying, moving, renaming, and deleting files and folders.
   d.   Printer types and functionalities, email attachments, and other file transfer and output.
2.   Demonstrate proficiency in utilizing various software applications to meet the needs of agricultural tracking, business development, presentations, and effectively communicating information.
   a.   Word processing software to create, format, edit, and manage documents relevant to agricultural documentation.
   b.   Electronic presentations using presentation software, incorporating multimedia elements, and graphics software.
   c.   Spreadsheet software to organize, analyze, and manipulate agricultural data, including calculations, graphing, and data visualization.
   d.   Design, create, and manage databases using database management software to organize and analyze agricultural data effectively.
3.   Apply computer software and templates to solve agriculture-related problems, including data analysis, reporting, and decision-making tasks, utilizing prepared software and templates where applicable.

AG 103 Precision Farming Technology (3 credit hours) Lecture (37.5 hrs)

Introduction to the most common tools used in precision farming: global positioning systems, geographic information systems, unmanned aerial systems (UAS), precision planters, variable rate technology, and yield monitoring.

1.   Describe the components and operation of common tools used in precision farming: global positioning systems, geographic information systems, unmanned aerial systems (UAS), precision planters, variable rate technology (VRT), and yield monitoring.
2.   Demonstrate proficiency in using GPS receivers to determine accurate positioning and navigation information for agricultural applications.
3.   Apply GIS software tools to analyze and visualize spatial data relevant to agricultural management decisions.
4.   Apply precision planting techniques to improve planting accuracy, seed-to-soil contact, and crop emergence in field operations.
5.   Apply VRT techniques to adjust seeding, fertilization, and pesticide application rates according to site-specific conditions and crop requirements.
6.   Interpret yield maps and data collected by yield monitors to assess crop performance, variability, and management practices' effectiveness.
7.   Integrate data collected from GPS, GIS, UAS, precision planters, VRT, and yield monitoring systems.
8.   Apply data management techniques to organize, analyze, and utilize integrated precision farming data for informed decision-making.

AG 121 Intro to Crop Science Lecture (3 credit hours) Lecture (37.5 hrs)

Introduction to the various plant species of economic importance; principles of plant growth, environment, selection, classification, cultural practices; weed, insect, and disease identification and control. **Co-Requisite: AG12X Intro to Crop Science Lab**.

1.   Identify economically important plant species and classify them based on taxonomy and economic relevance.
2.   Understand fundamental concepts of plant growth and development, including the influence of environmental factors.

3. Identify common weeds and implement integrated management strategies to control their impact on crop production.
4. Identify plant diseases, understand their causes, and implement strategies for prevention and control.
5. Evaluate and mitigate the impact of environmental factors on plant health and production.
6. Understand principles of plant breeding and select plant varieties based on desired traits and environmental adaptation.

AG 122 Intro to Crop Science Lab (1 credit hour) Lab (20 hrs)
Practical application of the use of various plant species of economic importance; principles of plant growth, environment, selection, classification, cultural practices; weed, insect, and disease identification and control. **Co-Requisite: AG 12X Intro to Crop Science Lecture.**
1. Apply effective planting, irrigation, fertilization, and pruning techniques to optimize plant health and productivity.
2. Recognize key insect pests, their biology, and behaviors, and employ integrated pest management techniques for control.
3. Apply sustainable soil management practices to support plant growth and ecosystem health.
4. Adhere to safety protocols and regulatory guidelines in the use of pesticides, fertilizers, and other agricultural inputs.
5. Evaluate and mitigate the impact of environmental factors on plant health and production.

AG 151 Agricultural Spatial Analysis (3 credit hours) Lab (60 hrs)
Provides a background in the analysis of spatial data. Specific topics include transformation and retrieval of data, analytical techniques, and spatial modeling. Concepts of multivariate and multitemporal analysis.
1. Define spatial data and explain its relevance in various fields, including geography, environmental science, urban planning, and agriculture.
2. Apply techniques for data transformation, including projection, resampling, and georeferencing, to prepare spatial data for analysis.
3. Implement appropriate spatial analysis methods to address specific research questions and objectives using software tools such as Geographic Information Systems (GIS) and statistical packages.
4. Apply multivariate statistical techniques to analyze spatial data sets with multiple variables.
5. Apply temporal analysis techniques to assess and analyze temporal trends, patterns, and dynamics in spatial phenomena.
6. Utilize visualization techniques to represent spatial data effectively, including thematic mapping, cartographic design principles, and 3D visualization methods.
7. Evaluate the quality and accuracy of spatial data sets and identify sources of error and uncertainty.
8. Develop and present spatial analysis solutions to stakeholders, demonstrating the practical utility and relevance of spatial data analysis skills.

AG 152 Applications of GIS in Agriculture (3 credit hours) Lecture (37.5 hrs)
Fundamental processes of geographic information systems (GIS) with application to agriculture. File formats, database management, spatial analysis, and manipulation of data. Georeferenced data from mapping and yield monitoring. **Pre-Requisite: AG 10X Agricultural Computer Applications.**
1. Identify common GIS file formats (e.g., shapefiles, GeoTIFFs, KML) and understand their characteristics, applications and significance in agriculture
2. Apply spatial analysis techniques such as buffering, overlay analysis, proximity analysis, and spatial interpolation in agricultural contexts.
3. Process spatial data within GIS software, including data merging, clipping, projecting, and filtering.
4. Analyze georeferenced yield monitoring data within GIS to identify spatial patterns and variability in crop yields.
5. Apply cartographic principles to design informative and visually appealing maps for agricultural applications.
6. Utilize GIS-based decision support tools and remote sensing tools to assist in agricultural planning, land management, crop selection, and decision-making agriculture practices.
7. Apply GIS in agribusiness contexts, including farm management, precision agriculture, supply chain management, and market analysis.

AG 153 Precision Hardware Systems (2 credit hours) Lab (40 hrs)
Introduction to operation, troubleshooting, repair, and calibration of precision agriculture components of auto-guidance systems, planters, combines, and application equipment. **Pre-Requisite: AG 11X Precision Farming Technology**

1. Identify the key precision agriculture components, including auto-guidance systems, planters, combines, and application equipment.
2. Explain the principles of operation and the role of each component in precision agriculture workflows.
3. Demonstrate proficiency in operating precision agriculture equipment, including setting up and calibrating auto-guidance systems, planters, combines, and application equipment.
4. Utilize troubleshooting techniques to diagnose problems systematically and efficiently, considering both mechanical and electronic aspects.
5. Execute routine maintenance tasks to ensure the proper functioning and longevity of precision agriculture components.
6. Demonstrate proficiency in repairing and replacing faulty components, following safety protocols and manufacturer guidelines.

AG 171 Intro to Soil Science Lecture (3 credit hours) Lecture (37.5 hrs)

Fundamentals of soil formation, development, texture, structure, color, temperature, moisture, organisms, organic matter, chemical composition, clay minerals, classification, nutrient testing, fertilizer use, conservation, and management. **Co-Requisite: AG 172 Intro to Soil Science Lab**.

1. Explain the processes and factors involved in soil formation, including weathering, erosion, deposition, and organic matter accumulation.
2. Describe soil texture, structure, color, and their significance in soil classification and management.
3. Describe the diverse soil organisms and their roles in nutrient cycling, organic matter decomposition, soil structure formation, and plant-microbe interactions.
4. Evaluate soil erosion processes and conservation practices to prevent soil degradation and maintain soil productivity.
5. Determine the importance of organic matter in soil fertility, structure, and water-holding capacity.
6. Develop soil management plans incorporating sustainable practices and addressing specific soil-related challenges.

AG 172 Intro to Soil Science Lab (1 credit hours) Lab (20 hrs)

Practical identification of soil formation, development, texture, structure, color, temperature, moisture, organisms, organic matter, chemical composition, clay minerals, and classification. Application and process development for nutrient testing, fertilizer use, conservation, and management. **Co-Requisite: AG 171 Intro to Soil Science Lecture**.

1. Analyze the chemical composition of soils, including major and minor elements, pH, cation exchange capacity (CEC), and nutrient availability.
2. Apply soil classification systems such as the USDA Soil Taxonomy to classify soils based on their physical, chemical, and morphological characteristics.
3. Perform soil nutrient testing techniques to assess soil fertility status and nutrient deficiencies.
4. Evaluate soil erosion processes and conservation practices to prevent soil degradation and maintain soil productivity.
5. Determine the importance of organic matter in soil fertility, structure, and water-holding capacity.
6. Develop soil management plans incorporating sustainable practices and addressing specific soil-related challenges.

PDV 101 Professional Development (1 Credit Hour) Lecture (12.5 hrs)

This course delivers the basic background in professional behaviors, understanding of self, co-workers and supervisory positions. Students will participate and interact in specific elements of the class including role- plays, language development, conflict resolutions and basic employment issues.

1. Understanding Self
   a. Develop an understanding of self
   b. Communicate positively with others
   c. Determine leadership skills
2. Understanding the Work Environment
   a. Develop skills for success in dealing with co-workers
   b. Develop skills necessary to succeed in a multicultural setting
   c. Develop an understanding of the work environment
   d. Determine skills necessary to attract and retain customers
   e. Respect to superiors
   f. Develop soft skills that are necessary in the workplace
3. Processes
   a. Demonstrate decision making process

b. Ethics and legal issues in the work place
4. Applying Concepts
    a. Complete an application and interview with a prospective employer
    b. Complete resume, cover letter and thank you letter for prospective employer
    c. Conduct a professional interview

AG 211 Introduction to Agricultural Economics (3 credit hours) Lecture (37.5 hrs) Principles of economics as applied to agriculture; basic economic principles, finance, land, marketing, input allocation, pricing, international trade, agricultural policies, fiscal and monetary policies.

1. Explain fundamental economic concepts such as supply and demand, opportunity cost, elasticity, and market equilibrium.
2. Apply financial principles to agricultural business management, including budgeting, investment analysis, cost-benefit analysis, and risk assessment.
3. Evaluate factors influencing resource allocation decisions in agriculture, including land, labor, capital, and technology.
4. Analyze pricing mechanisms and strategies used in agricultural markets, including futures markets, auctions, and contracts.
5. Analyze the impact of agricultural policies, including subsidies, tariffs, quotas, and trade agreements, on domestic and international agricultural markets.
6. Understand the role of fiscal and monetary policies in shaping economic conditions and agricultural markets.
7. Evaluate economic instruments and policies for promoting environmental sustainability in agricultural production and resource management.
8. Evaluate agricultural policies and programs, including their objectives, effectiveness, and unintended consequences.

AG 212 Plant Pest Identification and Control (3 credit hours) Lecture (37.5 hrs)
Identification and control of weeds, insects, and diseases. Control methods include prevention, biological control, resistant varieties, and pesticides. Pesticide terminology, formulations, calibration, environmental concerns, safe handling, and laws and regulations concerning pesticides. **Prerequisite: AG 12X Intro to Crop Science Lecture; AG 12X Intro to Crop Science Lab. Possible Certification connection to this course**

1. Accurately define key pesticide terminology, including terms such as active ingredient, formulation, mode of action, persistence, pesticide formulations (e.g., liquids, dusts, granules), and their properties, including solubility, volatility, and application methods.
2. Identify common weed species, major pests, and common plant diseases that affect agricultural production.
3. Investigate preventive measures to minimize weed, insect, and disease infestations, such as crop rotation, sanitation practices, and quarantine procedures.
4. Evaluate biological control methods, including the use of natural predators, parasites, and pathogens to manage pest populations.
5. Calibrate pesticide application equipment to ensure accurate and uniform application rates to maximize efficiency and profit, while maintaining environmental stewardship.
6. Distinguish proper handling of pesticides according to local, state, and federal laws and regulations including, storage and disposal of pesticides to prevent accidents and minimize human exposure.
7. Prescribe recommended control methods using the principles of Integrated Pest Management (IPM), including the use of multiple control tactics in a coordinated and sustainable manner.

AG 221 Precision Data Analytics (3 credit hours) Lecture (37.5 hrs)
Advanced processes of data mining, analysis, reporting and interpretation of agriculture data from various precision agriculture platforms. Prerequisite: AG 7

1. Collect and process raw agricultural data from various precision agriculture platforms, including GPS-guided machinery, drones, sensors, and satellite imagery.
2. Utilize data fusion techniques to combine data from multiple sources for comprehensive analysis.
3. Apply advanced data mining techniques to agricultural datasets, such as classification, regression, clustering, and association rule mining.
4. Understanding of algorithm parameters, model evaluation metrics, and hyperparameter tuning techniques.
5. Generate comprehensive reports summarizing findings from agricultural data analysis, including key insights, and identify temporal patterns in crop growth, phenology, and environmental conditions.
6. Create thematic maps and analyze spatial patterns in crop yield, soil properties, and pest distribution.

7. Interpret findings from agricultural data analysis in the context of farm management decisions, such as crop planning, irrigation scheduling, and pest management.
8. Understanding of ethical considerations related to agricultural data analysis, including data privacy, confidentiality, and informed consent.

AG 222 Commercial UAS Ground School (3 credit hours) Lecture (37.5 hrs)

Prepares the student for FAA Commercial Unmanned Aircraft Systems (UAS) Pilot Certification. Covers regulations, airspace, aerodynamics, weather, performance, registration, and aeromedical factors. Commercial UAS certification requires passing an FAA written exam. Possible Certification Connected to this course

1. Understand airspace classifications, restrictions, and requirements for UAS operations.
2. Understand airspace restrictions and how they impact UAS operations.
3. Interpret weather reports, forecasts, and weather charts relevant to UAS flight.
4. Determine the factors affecting UAS performance, such as weight and balance, density altitude, and battery life.
5. Manage the registration process and associated regulations with UAS.

AG 251 Soil Fertility and Fertilizers (3 credit hours) Lecture/Lab (82.5 hrs)

Use of fertilizers for peak production at optimum cost; evaluation and comparison of different forms of macro- and micro-nutrients, their manufacture, handling, and application; plant and soil chemistry. **Prerequisite: AG 171 Intro to Soil Science Lecture; AG172 Intro to Soil Science Lab**

1. Monitor nutrient deficiencies and excesses based on plant symptoms and soil analysis.
2. Understand the basic soil chemistry principles, including soil pH, cation exchange capacity (CEC), and nutrient cycling.
3. Evaluate the nutrient content, solubility, and release characteristics of various fertilizer formulations.
4. Understand the safe handling practices for storing, transporting, and applying fertilizers.
5. Explain the different methods of fertilizer application, including broadcasting, banding, foliar spraying, and fertigation.
6. Calculate fertilizer application rates based on crop nutrient requirements and soil test results.
7. Determine the best management practices (BMPs) to minimize nutrient loss and environmental degradation while maximizing fertilizer efficiency.
8. Utilize fertilizer application techniques through field demonstrations and laboratory exercises.

AG 252 Remote Sensing Applications (3 credit hours) Lab

Introduction to the characteristics of various sensors, data collection and analysis applicable to remote sensing applications with traditional aerial platforms and civil unmanned aerial system (UAS) operations.

1. Understand the basic principles of remote sensing, including electromagnetic radiation, spectral signatures, and interaction with Earth's surface features.
2. Collect data using traditional aerial platforms (e.g., manned aircraft) and civil unmanned aerial systems (UAS).
3. Conduct qualitative and quantitative analysis of remote sensing data to extract meaningful information about land cover, land use, and environmental variables.
4. Understand the diverse applications of remote sensing across various fields, including agriculture, forestry, urban planning, environmental monitoring, and disaster management.
5. Perform geospatial analysis, such as image classification, change detection, and terrain modeling, using remote sensing and GIS techniques.
6. Report the legal frameworks governing remote sensing activities, including regulations related to data ownership, intellectual property rights, and airspace management.
7. Utilize the remote sensing software packages for data processing and analysis.

AG 271 Internship (3 credit hours) Internship (135 hrs)

Ag Internship provides students to gain knowledge and skills for various Agriculture Careers. Students will provide a detailed log of experiences and hours at an approved agricultural partnership. Internships can be in an industrial, professional, or private setting with direct on-site supervision from an experienced agricultural professional.

1. Identify career opportunities for Precision Agriculture
2. Identify and develop a training plan to include five specific, measurable intended outcomes for the placement/internship opportunity
3. Maintain and submit all required records and documentation throughout placement/internship.

4. Follow all recommended safety processes consistently and effectively.
5. Develop employable personality traits, attitudes, work habits, and communication skills essential for success on the job.
6. Understand industry standards and requirements.
7. Demonstrate ability to work with others.
8. Demonstrate punctuality and dependability by being at work when required.

- *Provide a Program of Study/Degree Plan for the proposed program including a semester-by-semester outline that delineates required and elective courses and notes each program exit point.*

Flint Hills Technical College

Precision Agriculture (AG) – Technical Certificate

Course #	Course Title	Hours	Sem FT	Sem PT
PDV 001	First Year Experience	0	Fall	1st Fall
AG 101 Lec	Intro to Precision Agriculture	1	Fall	1st Fall
AG 102 Lec	Agricultural Computer Applications	3	Fall	1st Fall
AG 103 Lec	Precision Farming Technology	3	Fall	1st Fall
AG 121 Lec	Into to Crop Science Lecture	3	Fall	2nd Fall
AG 122 Lab	Intro to Crop Science Lab	1	Fall	2nd Fall
MA 108/ 110	*Essentials Math or College Algebra*	*3*	Fall	2nd Fall
AG 151 Lab	Agricultural Spatial Analysis	3	Spring	1st Spring
AG 152 Lec	Applications of GIS in Agriculture	3	Spring	1st Spring
AG 153 Lab	Precision Hardware Systems	2	Spring	1st Spring
AG 171 Lec	Intro to Soil Science Lecture	3	Spring	2nd Spring
AG 172 Lab	Intro to Soil Science Lab	1	Spring	2nd Spring
PDV 101	Professional Development	1	Spring	2nd Spring
EG 100/ 103	*English for Technical Professions or English Comp I*	3	Spring	2nd Spring
	Total Hours for Technical Certificate B	**30**		

Precision Agriculture (AG) – Associate in Applied Science
Associate Technical Education Credits (12 credit hours)

Course #	Course Title	Hours	Sem FT	Sem PT
AG 211 Lec	Introduction to Agricultural Economics	3	Fall	3rd Fall
AG 212 Lec	Plant Pest Identification and Control	3	Fall	3rd Fall
AG 221 Lec	Precision Data Analytics	3	Fall	4th Fall
AG 222 Lec	Commercial Drone Ground School	3	Fall	4th Fall
PS/BI/CH	*General Education Science*	*4 or 5*	Fall	4th Fall
AG 251 Lec/Lab	Soil Fertility and Fertilizers	3	Spring	3rd Spring
AG 252 Lab	Remote Sensing Applications	3	Spring	3rd Spring
AG 271 Int	Agricultural Internship	3	Spring	4th Spring
HI/SO/PY	*General Education Social Science*	3	Spring	3rd/4th Spring
SP	*General Education Oral Communication*	3	Spring	3rd/4th Spring

Total Hour for AAS Degree	61-62		

- *If the proposed program includes multiple curricula (e.g., pathways, tracks, concentrations, emphases, options, specializations, etc.), identify courses unique to each alternative.*

  Not Applicable

- *List any pertinent program accreditation available:*
  - *Provide a rationale for seeking or not seeking said accreditation.*
  - *If seeking accreditation, also describe the plan to achieve it.*
  -

  Not Applicable

- *If the program/coursework will be made available to high school students, provide letters of support from local high schools and/or districts that intend to participate.*

  See Appendix B for these letters.

Faculty
- *Describe faculty qualifications and/or certifications required to teach in the proposed program.*

Policy 3.07 UNCLASSIFIED APPOINTMENTS
Unclassified appointments apply to all College employees except those who have classified positions, or those hired as student employees. An unclassified appointment includes executive, academic, professional, computer, outside sales, or administrative appointments. The appointment category may include both academic and administrative responsibilities.

UNCLASSIFIED APPOINTMENTS PROCEDURE

3.07.01 Qualifications Duties

A comprehensive job description and list of duties shall be established by the administration. All unclassified job descriptions shall meet the standards of an exempt position under the Fair Labor and Standards Acts. Salaries and compensation shall be set by the administration in keeping with regional and professional market rates. Salaries for full-time academic, unclassified appointments shall be set forth under the master contract.

1. Academic Appointments: All academic appointments must meet the minimum requirements established by accreditation standards for the institution and/or program.
2. General Education Courses: A master's degree or higher in the discipline or sub-field of the courses taught OR a master's degree or higher in a different discipline or sub-field plus a minimum of 18 graduate credit hours in the discipline or sub-field of the courses taught.
3. Technical Skill Courses: A bachelor's degree in the field or a related field of study is preferred OR an Associate's Degree and a minimum of two years of work in the field. Specialized programs meet active licensure and renewal requirements.
4. Specialty Certification Courses: Meet specialized licensure and/or certification requirements in order to be a qualified instructor. Associate or bachelor's degree in a related field preferred.

*Cost and Funding for Proposed Program
- *Provide a detailed budget narrative that describes all costs associated with the proposed program (physical facilities, equipment, faculty, instructional materials, accreditation, etc.).*

  The budget for the FHTC Precision Ag Program falls into the following categories:
  - The first year of the program we will have one full time faculty. The salary for this person has been included in the local budget however, this also may be covered under the USDA Grant that our grant writer is applying. A second faculty will be added the second year and will be covered by the local budget.

- Equipment for the program (lab equipment, drones, side by side and other) will be covered by the local budget and/or the USDA grant. Farming equipment needed for several of the courses will be shared through the implement dealers in the area that are also part of the PAC.
- Tools and other supplies will be covered by student fees in the program and Perkins funding.
- There will be a metal building built for our labs and classrooms. This will be built on land already owned by the college. A 500 square foot greenhouse will also be built along with this building. The FHTC Foundation is obtaining funding for the main building through local donations. Our grant writer is also applying for a Frontier Farm Credit Grant for the greenhouse.

The FHTC grant writer has begun the process of filling out two separate grants:
- **Working Here Fund through Frontier Farm Credit**
- **USDA NIFA Agriculture and Food Research Initiative Competitive Grants Program Education and Workforce Development**

FHTC also has the financial support of the local implement dealers to use of equipment and land which is a high cost area for this program. The land for the building that will house the program is already available. It will be located adjacent to the FHTC welding facility. This will also simplify the two programs working together as part of a bigger agricultural picture. FHTC has money allocated in the local budget, Perkins grant allocation, and possible city and county money (JIIST Grant) available for this program.

- *Provide detail on **CA-1a form.***

  See Appendix C

- *Describe any grants (including requirements of the grant) or outside funding sources that will be used for the initial startup of the new program and to sustain the proposed program.*

  USDA NIFA Agriculture and Food Research Initiative Competitive Grants Program Education and Workforce Development
  The AFRI's EWD program supports professional development opportunities for K-14 educational professionals, non-formal education that cultivates food and agricultural interest in youth, workforce training at community, junior, and technical colleges, training of undergraduate students in research and extension, and fellowships for predoctoral candidates and postdoctoral scholars. The two specific areas in which FHTC is applying are Professional Development for Agricultural Literacy and Agricultural Workforce Training at Community Colleges.

  Professional Development for Agricultural Literacy seeks to increase the number of K-14 educational professionals trained in food and agricultural sciences. Participants are expected to develop and apply necessary skills for integrating food and agricultural science concepts in their classes; explore the opportunities available in food and agricultural science career paths, and forge mentorships with professional and business leaders. The maximum award amount is $500,000, including indirect costs. A maximum of 50% of project direct costs requested must be for participant support such as participant stipends, cost of subsistence (housing, meals) for immersive experiences, reasonable travel, classroom materials and teaching kits, and laboratory use fees. The submission date for this grant is September 12, 2024.

The Agricultural Workforce Training program seeks to develop a workforce ready for the field and industry jobs in the food and agricultural sector. By developing new workforce training programs, this program will expand jobs-based experiential learning opportunities, acquisition of industry-accepted credentials, and occupational competencies for students to enable a work-ready labor force for the 21st century. The AWT offers two focus areas: design and implementation. Design projects are 12-24 months in duration and seek to support faculty and staff to design and develop new credential workforce training programs that will train the workforce once the credential is recognized by the cognizant institution. The maximum award amount for design projects is $250,000, including direct costs. Implementation projects are 36-48 months in duration and seek to train students to acquire the skills and tools necessary to secure an industry-accepted credential and join the workforce. The maximum award amount for an implementation project is $650,000, including direct costs.

Working Here Fund through Frontier Farm Credit
The Working Here Fund offers three funding options with unique requirements to support rural communities. Their focus areas include ag education, hunger and nutrition, and rural disaster relief/essential services. The project budget must be $25,000+ and funding is only available for up to 50% of the total budget. Projects funded through this opportunity include capital campaigns, major agricultural or food distribution facility renovations, agricultural education facility expansion programs, and new agricultural education initiatives.

- *Additional cost and funding documents to include as needed:*
    - *Provide Excel in CTE fee details on the **CA-1b form** if the program will be offered to high school students and requesting approval for fees.*
    - *If the program is requesting Perkins funding, provide details on the **CA-1c form**.*
    - *If the program is requesting KS Promise Act eligibility, provide details on the **CA-1d form**.*

    See Appendix C

Program Review and Assessment
- *Describe the institution's program review cycle, and anticipated review timeframe for proposed program.*

Policy 5.16 PROGRAM REVIEW

Flint Hills Technical College will regularly review all academic programs in order to facilitate academic planning and improvement. This process should ensure that current student learning outcomes are reflective of current practice within the program of study. Outcomes should directly reflect the needs of students, related field of work, and community. Review procedures shall be developed and overseen by the Assessment Committee and enacted by institutional administration. Regular review and reporting shall be provided to the Board of Trustees and other key stakeholders.

Flint Hills Technical College has implemented a four-year cycle of review. The program collects data on required elements for four consecutive years and then submits a formal program review document. The program review form encompasses the following areas for review:
    I.   Mission
    II.   Faculty & Staffing
    III.   Curriculum
    IV.   Assurance
    V.   Resources

VI.   Feedback from Stakeholders
VII.   Analysis and Action Plan

After submission, the document is reviewed by the nine-member Assessment Committee for general feedback on data analysis and use throughout the report. The document is then reviewed by a team of "decision makers" across the institution. The decision-makers team members and faculty meet in the program area to discuss findings before the report is formally accepted. Identified action steps, improvement goals, or other highlighted areas are noted in the next cycle for tracking and progress reporting.

*Program Approval at the Institution Level

- *Provide copies of the minutes at which the new program was approved from the following groups:*
    - **Program Advisory Committee**
      (Including a list of the business and industry members)

See Appendix D for all Program Advisory Committee minutes.
The final proposal was sent to the PAC members and asked that they approve the submission. It was approved.

Program Advisory Committee Precision Agriculture		
Name	**Type of Business**	**Business**
Michelle Olson	Farm/Ranch	Davis Farms
Richard Dugan	Equipment	KAN-Equip
Aaron Tim	Equipment	KAN-Equip
Jacquelyn Leffler	Farm/Ranch	Leffler Prime Performance
Neal Nurnberg	Farm/Ranch	Farm
Nik Roth	Equipment	Prairie Land Partners-John Deere
Lee Schaefer	Equipment	Schaefer Equipment Company
Amy Jenkins	Secondary School	Emporia High School
Matt Railsback	Secondary School	MdCV High School
Dr. Kelly Hoelting	Secondary School	Mission Valley High School
Eric Schmidt	Farm/Ranch	Farm
Gabe Gantz	Equipment	Modern Ag

- **Curriculum Committee**

Curriculum Subcommittee:

Date of Meeting: 05/02/2024

A= Approved   D= Disapprove   N=No vote/Not available

MEMBER NAME (A. Smith)	VOTE		MEMBER NAME (A. Smith)	VOTE	
Leann Garcia	A	·	Russell Thrailkill	A	·
Elena De Leon	A	·	Chris Wilson	N	·
Brenda Carmichael	A	·	Troy Hobelmann	A	·
Anna Crabtree	N	·		N	·
Denise Gilligan	A	·		N	·

CHAIR of Committee: **Leann Garcia** Digitally signed by Leann Garcia Date: 2024.05.02 14:07:48 -05'00'   Date:

- ## Instructional Services Committee

MEMBER NAME – ATTENDANCE							
	Present		Present		Present		Present
Zach Arvieux	P	Kim Dhority	P	Albaro Miranda	A	Adam Starr	P
Corryn Brewer	P	Barb Evans	P	Katherine Morgan	P	Russell Thrailkill	P
Andrea Cahoone	P	Leann Garcia	P	Gary Preston	P		
Anna Crabtree	P			Amy Rhoads	P	Casey Wilson	P
		Troy Hobelmann	P	Nancy Robinson	P	Chris Wilson	P
Elena De Leon	P	Russ Criger	P				
Jeff Devilbiss	P	Judy McIntosh	A	Vicki Schweinler	P		
Guests:							
(P) – Present		(A) – Absent, No Prior Communication			(Notified A) – Absent and Communicated Ahead		

This was an email vote to approve the following items:

1. Curriculum Subcommittee moved to approve the Precision Agriculture curriculum as a new program.
   Second- Adam Starr. It passed.

2. Policies and Procedure moved to approve the procedures for 5.05.
   Second- Adam Starr. It passed.

3. General Education Subcommittee moved to approve adding United States History Since 1877 as an option for the Social Science requirement.
   Second- Adam Starr. It passed.

- ## Governing Board
  (Including a list of all Board members and indicate those in attendance at the approval meeting)

  This information was copied from FHTC Board Docs:

  > Agenda Item Details
  > Meeting Jun 10, 2024 - FHTC Board of Trustees
  > Category NEW BUSINESS
  > Subject New Program: Precision Agriculture Program Fall 2025
  > Type Action, Discussion Items, Information
  > Preferred Date Jun 10, 2024
  > Fiscal Impact Yes
  > Budgeted Yes
  > Budget Source Included in FY25 budget
  > Recommended Action June approval to align with new program submission processes per 2024-2025 TEA and KBOR meeting timelines.

  Flint Hills Technical College

  INFORMATION REGARDING BOARD AGENDA ITEM

TO:	Board of Trustees
DATE:	6/10/2024
PREPARED & SUBMITTED BY:	Denise Gilligan and Kim Dhority
SUBJECT:	New Program: Precision Agriculture

EXECUTIVE SUMMARY:

Before the New Program Application can be submitted to KBOR, it must be approved by the Board of Trustees. Meeting timelines and the new program schedule with the Technical Education Authority (TEA) and Kansas Board of Regents (KBOR) require the College to request approval at the June meeting. Denise Gilligan distributed this information to Board members in an email May 30, 2024.

The application (attached) for a new program is reviewed and approved by TEA and then advanced to KBOR. Due to the meeting schedule of both of these groups, the New Program paperwork needs to be submitted before July. The application is in process and we are finalizing these sections prior to submission to TEA and KBOR.

- Page 6: Demand from the Local Community. We are awaiting letters of support from employers and farm representatives.
- Page 13: Letters of support from high schools
- Page 16: The minutes from this June 2024 Board meeting with the Board member names.

RECOMMENDATION: Approve the New Program: Precision Agriculture to move forward with application submission to TEA then KBOR.

CA1_New_Program_Request_Form_2023 Percision Ag Board 6.10.24.pdf (627 KB)

Motion & Voting
June approval to align with new program submission processes per 2024-2025 TEA and KBOR meeting timelines.

Motion by Michael Black, second by Amanda Dreasher.
Final Resolution: Motion Carries
Yes: Pat Wiederholt, Amanda Dreasher, Leslie Seeley, Mandy Steffes, Michael Black, Jerry Spotswood

For full Board of Trustee Minutes:
https://go.boarddocs.com/ks/fhtc/Board.nsf/Public

Program Proposal Submission
- Please enter the proposed program into the Kansas Higher Education Data System (KHEDS)
- Please create a PDF of all documents, and submit the completed application to the following:

April Henry
Director of Workforce Development
ahenry@ksbor.org

Charmine Chambers
Associate Director for Workforce Development/Data/Finance
cchambers@ksbor.org

APPENDICES

Appendix A

June 08, 2024

To Whom It May Concern,

The agricultural community is thriving in the Emporia, Kansas area. My family farm and ranch operation began just fifteen miles to the Northwest of here in 1941 and is five generations strong. Unfortunately, not every operation has survived over the years for several reasons. I truly believe that a part of that reason is many "farm/ranch kids" go off to college in other towns to pursue an agricultural degree and never come back home. If we can offer a program in our own community, I firmly believe we will be able to retain those kids and add more who come here for an education to our area workforce. I know this is the hope we have for our own son someday. I couldn't be more excited for the opportunity the Flint Hills Technical College could provide to students who are wanting to pursue agriculture.

The Flint Hills Technical College is doing their due diligence by seeking out advice from local industry leaders, equipment dealerships and local farmers and ranchers. As a local farmer and rancher, it is our goal to provide the donation of time which is our most valuable asset in our industry. We hope to have students come out to operation and get real-life hands-on experience and observe the different trials we run both in the field and in the cabs of our equipment. By having this relationship, it is our goal to someday be able to not only employ a future graduate of this program but help them pursue their own dreams they want to accomplish as well.

I would like to take this time to highly encourage the approval of the Precision Agriculture program at Flint Hills Technical College. From learning about soil to the technology in the cab of equipment this diverse program will allow students to make an impact on our local and state agricultural community. The future of agriculture is truly in their hands and this program will only help the industry to continue to be the backbone of America.

Thank you,

Jacquelyne R. Leffler
Leffler Prime Performance
Leffler Farms, Inc.

June 3, 2024

Subject: Letter of Support for FHTC Precsion Ag Program

To Whom It May Concern,

I am writing to express our support of the Flint Hill Technical College Precsion Ag Program. Precision Ag is vital to enhancing farming efficiency and can easily improve daily planning, decision making, and the overall strategy for agricultural operations. The demand for knowledgeable and trained individuals in Precision Ag is critical to KanEquip's mission to be a leader and trusted partner in providing quality products, support, and innovative solutions to agricultural producers in the Midwest.

KanEquip is committed to supporting the Precsion Ag Program by serving as an advisory committee member and providing equipment, materials, and expertise. KanEquip will also provide internships, job shadows, mock interviews, and work-based learning opportunities for future students.

We are excited to see the Precision Ag Program at Flint Hills Technical College grow and develop. The impact that this will have on ag production and the industries that support ag production will be positive and valuable.

Richard Dugan
Recruiter
408 Lincoln Ave.
Wamego, KS 66547
O: 785.458.3325
C: 785.456.3178

6/14/2024

To Whom it May Concern,

I am writing in support of the Flint Hills Technical College Precision Ag Program. The future of Precision Ag is very crucial to farmers to help ensure efficiency with farming practices in the means of managing crop and livestock inputs which also include seed, feed, fertilizer, and chemicals, as well as several others. Educated and qualified trained individuals like those that Flint Hills Technical College plans to produce through their program are essential to Prairieland Partners' continued commitment to our customers and partners in the agriculture industry.

Prairieland Partners is committed to serving and supporting Flint Hills Technical College's Precision Ag program by providing equipment, knowledgeable staff, internships, hands on learning opportunities, and possible job placement opportunities for future students.

We are very excited to partner with the Precision Ag program at Flint Hills Technical College and to see it grow and develop into a program that will have a strong long-lasting impact on the ever so fast-changing world of technology.

Thank you,

Nik Roth

Emporia Store Manager

620-794-3998

nroth@plpjd.com

ModernAg
PRECISION SOLUTIONS
Find us on the web at www.modernaginc.com

Corporate Office:
408 Lincoln ⋄ Wamego, KS 66547
Ph: 785-456-2083 ⋄ Fax: 785-456-1999
E-mail: accounting@modernaginc.com

June 20, 2024

Re: Letter of Support Flints Hill Tech Precision Ag Program

To whom it may concern,

My name is Gabe Gantz and I am a Precision Ag Specialist for ModernAg Inc out of Topeka, KS. I have been in the Precision Ag field for 14 years and have seen the need recently for adding new faces to this industry especially with the rapid change of technology. I am excited to hear that Flint Hills Tech is looking to add a Precision Ag program to their great list of programs as it will be local for our territory and provide us with some new prospects to hire in the future. In agriculture many people stick around their local areas to help with farming operations but for most young people there is usually not room on these operations. By having programs like these spread across our state we are able to have a nice recruiting pool of new talent to add to our business as employees while also allowing them to stay local for their agricultural interests when not at work. This program also provides a nice avenue for young people who are going to return to the farm as it gives them a good foundation of Precision Ag skills and education that will stay with them as they grow to make agronomic decisions for their operations or provide assistance to their aging colleagues as the technology evolves. Our company is willing to help provide hardware and expertise to help this program take off and become a destination for local kids in the area. We also have opportunities with the vendors we are associated with for their assistance in resources for the program as well. In conclusion I am happy to announce our company and I's support for the Precision Ag program at Flint Hills Technical College in Emporia. I hope that you consider this program to be important to the local communities and businesses that will work alongside of it.

Sincerely,

Gabe Gantz

Precision Ag Specialist

ModernAg Inc

2901 NW US Hwy 24

Topeka, KS 66618

gabe.gantz@modernaginc.com

Appendix B

Burlington Schools

Unified School District #244

301 Neosho Street, Burlington, KS 66839

(620) 364-8478

June, 18, 2024

To whom it may concern:

I am writing this letter in support of the Precision Agriculture program that Flint Hills Technical College (FHTC) is looking to pursue with the Kansas Board of Regents. The value of this program would be an asset to students and their future.

FHTC has a terrific reputation for putting together excellent programs that provide hands-on learning that is practical for real world experiences. Precision Agriculture programs would benefit students in Kansas interested in ag-related jobs.

A Precision Agriculture program from FHTC would help economic growth and innovation in the ag industry. This is very important to the state of Kansas.

In conclusion, I believe in FHTC and this Precision Agriculture program. The benefits are too numerous to mention. Please contact me if you have any questions.

Sincerely,

Craig Marshall

Craig Marshall
USD 244 Superintendent

EMPORIA HIGH SCHOOL

Dear KBOR,

It is with high interest that I am writing to you in support of the FHTC Precision Ag Program. Our partnership with FHTC has grown extensively over the past decade and the number of students from Emporia High School who take advantage of their programs has grown as well. One partnership I believe we have been missing over the past decade relates to the field of agriculture. As you know, Emporia is in the heart of agriculture in Kansas. The interest in agriculture from our student body is just as high as other fields of study for postsecondary success.

Some benefits this program will provide for our students interested in agriculture that we cannot provide in our building is the learning about technology in agriculture and internships for future employment experiences. KSDE has recently adopted new graduation requirements for the class of 2028 and beyond. These new requirements require a higher focus on STEM, computer science, and assets related to post secondary job success. It is our opinion that this new program at FHTC will fit smoothly into these new expectations, allowing more students the opportunity to expand on their development of these requirements in an area that fits with their individual plan of study.

Please consider this my formal request to support FHTC and the future of this new program.

Sincerely,

Dathan Fischer, Principal

I have had the pleasure of working with Flint Hills Technical College as the USD 243 Lebo-Waverly 6-12 School Counselor since 2013. The Flint Hills Technical College staff has impressed me with the willingness to work with individuals, groups and our schools to improve things for the good of our high school students.

The addition of a Precision Agriculture program would greatly benefit the students in our district as well as the surrounding districts. In USD 243, we offer the following agricultural pathways: Comprehensive Agriculture Science and Power, Structural and Technical Systems. As a small district, we have one agriculture teacher and the program is housed in Lebo. This means our Waverly students must travel to Lebo in order to participate in our agriculture pathway classes and this is not always possible due to scheduling conflicts.

The addition of a Precision Agriculture program at Flint Hills Technical College would help USD 243 to provide more opportunities for all of our students and I firmly believe that the surrounding rural, small districts would share this belief.

Sincerely,

Janella M Newton

Janella M Newton
243 Lebo-Waverly 6-12 School Counselor

Mission Valley
FFA

Dear Members of the Board,

I am writing to express my strong support for the establishment of a Precision Agriculture technical program at Flint Hills Technical College. As the Agricultural Education teacher at Mission Valley High School, I have witnessed firsthand the transformative impact that advanced agricultural education can have on our students, our community, and the agricultural industry as a whole.

Precision Agriculture represents the future of farming, combining cutting-edge technology with traditional agricultural practices to improve efficiency, sustainability, and productivity. By integrating tools such as GPS mapping, remote sensing, and data analytics, farmers can make more informed decisions that enhance crop yields, reduce waste, and conserve resources. This approach is not only vital for the economic viability of modern farming but also for addressing global challenges such as food security and environmental stewardship. Introducing a Precision Agriculture program at Flint Hills Technical College would provide our students with the opportunity to acquire essential skills that are in high demand in today's job market. The program would equip them with the knowledge and experience needed to excel in various roles, from farm management to agricultural technology development.

At Mission Valley High School, we have a vibrant and growing interest in agricultural education. Our students are passionate about pursuing careers in agriculture, and many have expressed a keen interest in the technological aspects of modern farming. The creation of a Precision Agriculture program would provide a seamless pathway for these students to continue their education and professional development locally. It would foster connections between our institutions, enabling collaborative initiatives such as internships, workshops, and research projects. Farmers and agribusinesses in our region are increasingly adopting precision agriculture technologies, and there is a growing need for skilled professionals who can implement and manage these systems. Flint Hills Technical College's new program would help bridge this skills gap, ensuring that our local economy remains competitive and resilient.

In conclusion, I endorse the creation of a Precision Agriculture technical program at Flint Hills Technical College. This initiative aligns with the educational and economic needs of our community and promises to provide significant benefits for students, farmers, and the broader agricultural industry. I am confident that with your support, Flint Hills Technical College can become a cornerstone for precision agriculture education and innovation.

Sincerely,

Kelly Hoelting

Dr. Kelly Hoelting
Agricultural Education Teacher
Mission Valley High School

The FFA Mission
*FFA makes a positive difference in the lives of students by developing their potential for **premier leadership, personal growth and career success** through agricultural education.*

USD 330 Mission Valley Jr/Sr High School

Home of the Vikings

12913 Mission Valley Road, Suite A,
Eskridge, KS 66423
Randy Wild----Principal
rwild@mv330.org   866.557.6686   www.mv330.org

To whom it may concern:

Mission Valley Junior Senior High School would greatly support the addition of The Precision Agriculture Program at Flint Hills Technical College. We believe that this program would benefit our students, communities, and local businesses who operate in the world of agriculture.

Mission Valley USD 330 has enjoyed a successful partnership with FHTC over the years, and we believe that the addition of this programming will allow that partnership to grow and enable us to send more students in the future. Local businesses such as Harveyville Seed, located in Harveyville Kansas which resides in our school district and are always looking for skilled workers who are well-versed in precision agriculture systems.

It is our opinion that the field of precision agriculture is a high demand field that all of our patrons can benefit from being able to access training at a local educational institution such as FHTC.

Please contact us if you have any questions.

William Clark Superintendent

Randy Wild Principal

	USD 330 Board of Education	
Jacob Durkes--President		*Jon Deters--Vice President*
Chris Campbell Shay Foster	*Mistina Kraus Nick Beasterfeld*	*Leslie Wines*

Lyndon USD #421

421 East 6th Street   PO Box 488
Lyndon, KS 66451
Phone: 785-828-4413
Fax: 785-828-3686

To Whom It May Concern:

Lyndon USD 421 is excited to learn about the new and innovative program of Precision Agriculture. Here at Lyndon we have a strong Ag and FFA program and would welcome an opportunity to partner with Flint Hills Technical College. This would benefit not only our students but the entire community, local businesses and farmers who operate in the new age of agriculture.

In our opinion, we feel that field precision agriculture is the future of farming. There will be a high demand moving forward as technology continues to integrate itself with the different farming occupations. We feel having access to this exciting and up and coming field so close to us at Flint Hills Technical College will help our students in their endeavors. We are confident that our students will enroll in this program.

For many decades we have had a fantastic relationship with Flint Hills Technical College. Their faculty expertise and attention to detail will no doubt help produce a top-notch program for all students in East Central Kansas. We are hopeful the Board of Regents will approve the proposal for the addition of a Precision Agriculture program at FHTC. We must protect the farming industry and prepare students for the future. Our world depends on it.

Sincerely,

Brad Marcotte
USD 421 Superintendent

Brad Marcotte, Superintendent: marcotteb@usd421.org
Teresa Fitch, Board Clerk: fitcht@usd421.org
Teressa Martin, District Secretary/Board Treasurer: martint@usd421.org
Follow us on Facebook @ Lyndon USD 421, twitter @LyndonHSTigers, or webpage www.usd421.org
IT'S A GREAT DAY TO BE A TIGER!

Appendix C

KBOR Fiscal Summary for Proposed Academic Programs

Institution: _Flint Hills Technical College__
Proposed Program: _Precision Ag_____

IMPLEMENTATION COSTS				
Part I. Anticipated Enrollment		Implementation Year		
Please state how many students/credit hours are expected during the initial year of the program? 20 students/450credit hours				
		Full-Time		Part-Time
A. Headcount:		10		10
Part II. Initial Budget		Implementation Year		
A. Faculty		Existing:	New:	Funding Source:
Full-time	#1	$0	$60,000	Local Budget/USDA Graint
Part-time/Adjunct	#0	$0	$	
		Amount	Funding Source	
B. Equipment required for program (lab equipment)		$2000	Local Budget/USDA Grant	
Drone with software		$500	Local Budget/USDA Grant	
Side by Side Utility Vehicle		$20,000	Local Budget/USDA Grant	
Farm Equipment		----------	Loan from Implement Dealer	
C. Tools and/or supplies required for the program		$3000	Local Budget/Student fees	
D. Instructional Supplies and Materials		$2000	Student Fees	
E. Facility requirements, including facility modifications and/or classroom renovations (this would be for a 14,000 foot building with classroom and office space along with shop area.)		$2,000,000	Foundation	
Greenhouse (500 square foot)		$40,000	Frontier Farm Credit Grant Foundation	
F. Technology and/or Software		$7000	Local Budget	
Computers and cart		$35,000	Grant	
G. Other *(Please identify; add lines as required)* Travel/Professional Development Memberships		$1500 $100	Perkins Local Budget	
Total for Implementation Year		2,171,100		

KBOR Fiscal Summary for Proposed Academic Programs

CA-1a Form (2020)

PROGRAM SUSTAINABILITY COSTS (Second and Third Years)				
Part I. Program Enrollment		Second and Third Years		
Please state how many students/credit hours are expected during the first two years of the program? 30 students /600 credit hours				
		Full-Time	Part-Time	
A. Headcount:		10	20	
Part II. Ongoing Program Costs		First Two Years		
A. Faculty		Existing:	New:	Funding Source:
Full-time	#2	$60,000	$60,000	Local Budget/USDA Grant
Part-time	#	$	$	
		Amount	Funding Source	
B. Equipment required for program (Lab)		$2000	Local Budget	
Farm Equipment (Implement dealers have been very definite about working with them on loaning of equipment. However, we may want to start purchasing some older equipment of our own.)		----------	Loan from Implement Dealer	
C. Tools and/or supplies required for the program		$3000	Perkins/Local Grant	
D. Instructional Supplies and Materials		$2000	Student Fees	
E. Facility requirements, including facility modifications and/or classroom renovations		$		
F. Technology and/or Software		$7000	Local Budget	
G. Other *(Please identify; add lines as required)* Travel/Professional Development Memberships		$1500 $100	Perkins Local Budget	
Total for Program Sustainability		135,600		

Please indicate any additional support and/or funding for the proposed program:

Submit the completed application and supporting documents to the following:

Director of Workforce Development
Kansas Board of Regents
1000 SW Jackson St., Suite 520
Topeka, Kansas 66612-1368

Per statute (K.S.A. 72-3810), the Kansas Board of Regents shall establish general guidelines for tuition and fee schedules in career technical education courses and programs. The Excel in CTE tuition and fee schedule of every technical education program shall be subject to annual approval.
*Please include all costs charged to **high school students** for the proposed new program.*

Institution Name:	Flint Hills Technical College
Program Title:	Precision Agriculture
Program CIP Code:	1.0205

*Please list all fees associated with this **program**:*
*Only list costs the institution **is** charging students.*

Fee	Short Description	Amount
Certification	Private Pesticide Applicators	$ 25.00
License	Remote Pilot License (Drone)	$ 150.00

*Please list all courses within the program and any fees associated to those **courses** :*
*Only list costs the institution **is** charging students. Do not duplicate expenses.*

Course ID	Short Description	Amount

Please list items the student will need to purchase on their own for this program:
*Institution **is not** charging students these costs, rather students are expected to have these items for the program.*

Item	Short Description	Estimated Amount

Carl D. Perkins Funding
Eligibility Request Form

Strengthening Career and Technical Education for the 21st Century Act

CA-1c Form (2022)

This application should be used for new programs (currently in the program approval process) or existing programs the institution would like reviewed for Carl D. Perkins funding eligibility.

Program Eligibility

Any program receiving Perkins funds must be designated as a technical program by KBOR. Definition of a technical program may be found in state statute K.S.A. 72-1802.

Program Levels:

Educational Award Level	Credit Hours
SAPP	1-15
Certificate A	16-29
Certificate B	30-44
Certificate C	45-59
Associate of Applied Science	60-69

Stand-Alone Parent Program (SAPP) criteria:
1. Designated as "Technical Program" in KHEDS
2. Leads to an industry-recognized credential
3. Leads to a specific occupation
4. Addressed and evaluated in the Comprehensive Local Needs Assessment
5. Minimum 6 concentrators (average over the previous two academic years)
6. Instructor/Trainer/Teacher programs and Workforce AID programs are not eligible

Certificates and Associate of Applied Science (CERT and AAS) criteria:
1. Designated as "Technical Program" in KHEDS
2. Aligned at the state level (for select aligned programs). Visit the program alignment section of the KBOR website for the list of aligned programs at the state level.
3. Addressed and evaluated in the Comprehensive Local Needs Assessment
4. Minimum 6 concentrators (average over the previous two academic years)
5. Instructor/Trainer/Teacher programs and Workforce AID programs are not eligible

Carl D. Perkins Funding
Eligibility Request Form

Strengthening Career and Technical Education for the 21st Century Act

CA-1c Form (2022)

Name of Institution	Flint Hills Technical College
Name, title, phone, and email of person submitting the Perkins Eligibility application *(contact person for the approval process)*	Kim Dhority, Dean of Academic Affairs 620.341.1345 kdhority@fhtc.edu
Name, title, phone, and email of the Perkins Coordinator	Kim Dhority, Dean of Academic Affairs
Program Name	Precision Agriculture Technology
Program CIP Code	01.1102 Agronomy and Crop Science
Educational award levels <u>and</u> credit hours for the proposed request(s)	30 Credit Hours- Technical Certificate B 61-62 Credit Hours- Associate of Applied Science
Number of concentrators for the educational level	15 to 25
Does the program meet program alignment?	No existing program alignment.
How does the needs assessment address the occupation and the program *(provide page number/section number from the CLNA and describe the need for the program)*	On page 14 of the Region 5 Comprehensive local needs assessment it lists Precision Agriculture as a + 9.3% for Kansas growth.
Justification for conditional approval: *(how will Perkins funds will be used to develop/improve the program)*	Professional Development Equipment Course Development
Pursuant to Americans with Disabilities Act, the proposed program will be offered in a location or format is fully accessible, according to applicable ADA laws? *(Contact Board staff for technical assistance if there are questions regarding accessibility)*	FHTC will ensure that accommodations for students are met as needed. All facilities are accessible to all students.

Signature of College Official_____   *Kim Dhority*   Date_07/11/2024_____

Signature of KBOR Official_____   Date_____

Last updated: 4/13/2022

Appendix D

FLINT HILLS
TECHNICAL
COLLEGE

www.fhtc.edu
620.343.4600 | 800.711.6947 | fax: 620.343.4610
3301 West 18th Avenue | Emporia, Kansas 66801

Precision Agriculture
Program Advisory Council
Minutes
March 6, 2024

I. Introductions
We began the meeting by everyone going around and introducing themselves and their role in the agriculture committee. Those present were Michelle Olsen (farming), Jacquelyne Leffler (farming), Amy Jenkins (high school agriculture teacher), Kelly Holting (high school agriculture teacher), Eric Schmidt (farmer), Mike Crouch (FHTC Vice President of Advancement), Corey Spikes (FHTC Director of Economic Partnerships), and Kim Dhority (FHTC Dean of Academic Affairs). Implement dealers were invited to this meeting but were unable to attend.

II. Explanation of Process
Kim Dhority went through the process of how a process was created, went through the approval process at the Kansas Board of Regents, and the timeline to accomplish this task.

III. Evaluate Draft Program Mission
The program's mission and overall competencies of the program were discussed and evaluated. They were voted on by the members who were present and approved.

IV. Evaluate Draft Curriculum Documents
The next step in the process was to review curriculum and the courses that were going to be offered and the outcomes of those courses. As we discussed the courses, we discussed whether they would be lab courses lecture courses or combination of both. We discussed the order that they should be offered. As we discuss the curriculum for the program we also discussed equipment tools and other items that would be needed for the program. The list of courses and their competencies were voted on by those present and approved. The edits are attached to this document.

V.   Brainstorm Session on Needs of the Program
It was we had a brainstorming session on what other occupations would benefit from this program besides just equipment dealers and included in the list were crop spraying businesses, elevators, farming, insurance adjusters for ad programs, and many others

It was agreed that

VI.   Closing Comments
Since the implement dealers that were on the original membership list for this program advisory committee we're not able to attend, information about the program was set out for their approval. All four implement dealers returned a positive vote for the curriculum that we had proposed.

Proposed for PAC Discussion

Program Profile Information

"To revolutionize agricultural practices through the innovative application of technology, data analytics, and sustainable practices, maximizing efficiency, productivity, and environmental stewardship for the benefit of farmers, consumers, and the planet."

Overall, a two-year college precision agriculture program equips students with the knowledge, skills, and practical experience needed to pursue rewarding careers in modern agriculture while contributing to the sustainability and efficiency of agricultural production systems.

1. Students will gain proficiency in using precision agriculture technologies such as global positioning systems (GPS), geographic information systems (GIS), remote sensing, drones, sensors, and data analytics tools. They will be able to effectively collect, analyze, and interpret agricultural data to make informed decisions.

2. Students will develop skills in crop management techniques, including precision planting, variable rate application of fertilizers and pesticides, irrigation management, and crop monitoring using remote sensing and imaging technologies. They will understand how to optimize crop production while minimizing environmental impact.

3. Students will learn how to operate and maintain precision agriculture equipment, including GPS-guided tractors, drones, soil sensors, and automated irrigation systems. They will be able to troubleshoot equipment issues and perform routine maintenance tasks to ensure optimal performance.

4. Students will be proficient in analyzing agricultural data using statistical techniques, GIS software, and other data analysis tools. They will be able to interpret data to identify trends, make predictions, and optimize farm management practices for improved productivity and sustainability.

5. Students will develop skills in farm management practices, including budgeting, financial analysis, inventory management, and strategic planning. They will understand how to integrate precision agriculture technologies into overall farm operations to maximize efficiency and profitability.

6. Students will understand the importance of environmental stewardship in agriculture and how precision agriculture practices can help minimize environmental impact. They will be able to implement strategies to reduce chemical usage, conserve water resources, and promote soil health and biodiversity.

This would relate back to ISLO's

7. Students will develop strong communication and collaboration skills, enabling them to effectively communicate with farmers, agronomists, agricultural technicians, and other stakeholders. They will be able to work collaboratively on interdisciplinary teams to solve complex agricultural challenges.

8. Professional Ethics: Students will learn about professional ethics and integrity in agriculture, including issues related to data privacy, intellectual property rights, and

Equipment

agronimist

application

Comp Info
"Tech"

Buisness

Conservation

Name:		ID #	

Expected Graduation Date

Technical Certificate		Associate Applied Science	
1st Year Experience			

Flint Hills Technical College
Precision Agriculture (AG) – Technical Certificate

Course #	Course Title	Hours	Semester
	First Semester		
AG 1 LL	Introduction to Crop Science	4	
AG 2 Lec	Agricultural Applications of the Computer	3	
AG 3 Lec	Introduction to Precision Agriculture	1	
AG 4 Lec	Precision Farming Technology	3	
MA 108 or 110	*Essentials Math or College Algebra*	3	
		14	
	Second Semester		
AG 5 Lab	AG Spatial Analysis	3	
AG 6 LL	Introduction to Soil Science	4	
AG 7 LL	Applications of GIS in Agriculture	3	
AG 8 Lab	Precision Hardware Systems	2	
AG 9 Lec	Agri-Business Seminar	1	
EG 100 or EG 103	*English for Technical Professions OR English Comp I*	3	
		17 or 18	
	Total Hours	**31 or 32**	

handwritten notes: intro to plant + soil science; measure + ratios/%; Pesticide application license; letter/email

Precision Agriculture (AG) – Associate in Applied Science
Associate Technical Education Credits (12 credit hours)

Course #	Course Title	Hours	Semester
	First Semester		
AG 10 Lec	Introduction to Agricultural Economics	4	
AG 11 Lec	Plan Pest Identification and Control	3	
AG 12 Lab	Precision Data Analytics	3	
AG 13 Lec	Commercial Drone Ground School	3	
	Science? Could we use Crop Science or Soil Science for the Science requirement	4 or 5	
		17	
	Second Semester		
AG 14 LL	Soil Fertility and Fertilizers	3	
AG 15 Lab	Remote Sensing Applications	3	
AG 16 Internship	Internship	3	
	General Education Social Science	3	
	General Education Oral Communication	3	
		15	

*handwritten notes: FAA; "Jackies" Precision Ag; • Equipment • Soil Services (Agronomist) • Application • Conservation; * Ansc side of precision * Wildlife mngt * Fire mngt/land; Kelly added; Gabe + Anthony; Modern Ag/ Trimble/; Schaefer / JD. / ARTS/ Agronomist/ KanEquip/ Murphy/ fertilizer; Concurrent classes*

Proposed for PAC Discussion

Precision Agriculture Course Descriptions

may be avail for K-State agreement

Lecture/Field (lab)

AG 1 Introduction to Crop Science (4 credit hours)
Various plant species of economic importance; principles of plant growth, environment, selection, classification, cultural practices; weed, insect, and disease identification and control.

Course Competencies

- o Identify economically important plant species and classify them based on taxonomy and economic relevance.
- o Understand fundamental concepts of plant growth and development, including the influence of environmental factors.
- Field o Apply effective planting, irrigation, fertilization, and pruning techniques to optimize plant health and productivity.

conservation range school
- o Identify common weeds and implement integrated management strategies to control their impact on crop production.
- o Recognize key insect pests, their biology, and behaviors, and employ integrated pest management techniques for control.
- o Identify plant diseases, understand their causes, and implement strategies for Flashcards prevention and control.
- Field o Evaluate and mitigate the impact of environmental factors on plant health and production.
- o Understand principles of plant breeding and select plant varieties based on desired traits and environmental adaptation.
- Field o Apply sustainable soil management practices to support plant growth and ecosystem health.
- lab o Adhere to safety protocols and regulatory guidelines in the use of pesticides, fertilizers, and other agricultural inputs.

AG 2 Agricultural Applications of the Computer (3 credit hours) Comp Lab.
Introduction to computer hardware, platform environments, file manipulation, printers and the use of word processing, electronic presentations and communications, graphics, spreadsheet, and database management software; solution of agriculture data-related problems and use of prepared software and templates.

Course Competencies

- o Identify and describe basic components of computer hardware such as CPU, memory, storage devices, and peripherals.
- Comp Lab o Navigate and utilize various operating systems and platform environments commonly used in agriculture, such as Windows, macOS, and Linux.
- Comp Lab o Demonstrate proficiency in file management tasks including creating, organizing, copying, moving, renaming, and deleting files and folders.

- Understand printer types and functionalities commonly used in agricultural settings and effectively operate printers for document output.
- Utilize word processing software to create, format, edit, and manage documents relevant to agricultural documentation and communication needs.
- Develop and deliver effective electronic presentations using presentation software, incorporating multimedia elements, and effectively communicating agricultural information.
- Utilize graphics software to create and edit images, charts, diagrams, and other visual representations relevant to agriculture-related projects and presentations.
- Demonstrate proficiency in spreadsheet software to organize, analyze, and manipulate agricultural data, including calculations, graphing, and data visualization.
- Design, create, and manage databases using database management software to organize and analyze agricultural data effectively.
- Apply computer software and templates to solve agriculture-related problems, including data analysis, reporting, and decision-making tasks, utilizing prepared software and templates where applicable.

AG 3 Introduction to Precision Agriculture (1 credit hour) *15 hrs sitting lecture*

Introduction to precision agriculture, including history, applications, terminology, data management, and software. Exploration of precision agriculture career opportunities.

Course Competencies

- Explain the principles and historical development of precision agriculture, including its evolution, key milestones, and technological advancements.
- Analyze the significance of precision agriculture in improving agricultural efficiency, productivity, and sustainability.
- Identify and describe the various applications of precision agriculture technologies, such as GPS/GNSS guidance systems, remote sensing, variable rate technology, and drones.
- Define and utilize precision agriculture terminology, including terms related to data collection, analysis, and decision-making processes.
- Apply data management techniques to ensure data accuracy, integrity, and security in precision agriculture operations.
- Evaluate and utilize software tools commonly used in precision agriculture, such as Geographic Information Systems (GIS), farm management software, and data analysis platforms.
- Implement software applications for data processing, visualization, and decision support in precision agriculture workflows.
- Explore career pathways and opportunities in precision agriculture, including roles in farm management, agronomy, agricultural engineering, data analysis, and technology development. *animals, wildlife/fire mngt land*

AG 4 Precision Farming Technology (3 credit hours)

Introduction to the most common tools used in precision farming: global positioning systems, geographic information systems, unmanned aerial system (UAS), precision planters, variable rate technology, and yield monitoring.

Course Competencies:

- Explain the principles and functionalities of GPS technology in precision farming.
- Demonstrate proficiency in using GPS receivers to determine accurate positioning and navigation information for agricultural applications.
- Describe the role of GIS in precision farming and spatial data analysis.
- Apply GIS software tools to analyze and visualize spatial data relevant to agricultural management decisions.
- Understand the capabilities and applications of UAS (drones) in precision farming.
- Describe the features and functions of precision planters in optimizing seed placement and spacing.
- Apply precision planting techniques to improve planting accuracy, seed-to-soil contact, and crop emergence in field operations.
- Explain the principles and benefits of Variable Rate Technology (VRT) in optimizing input application rates based on spatial variability.
- Apply VRT techniques to adjust seeding, fertilization, and pesticide application rates according to site-specific conditions and crop requirements.
- Describe the components and operation of yield monitoring systems for harvesting equipment.
- Interpret yield maps and data collected by yield monitors to assess crop performance, variability, and management practices' effectiveness.
- Integrate data collected from GPS, GIS, UAS, precision planters, VRT, and yield monitoring systems.
- Apply data management techniques to organize, analyze, and utilize integrated precision farming data for informed decision-making.

AG 5 Agricultural Spatial Analysis (3 credit hours)

Provides a background in the analysis of spatial data. Specific topic includes transformation and retrieval of data, analytical techniques and spatial modeling. Concepts of multivariate and multitemporal analysis.

Course Competencies:

- Define spatial data and explain its relevance in various fields, including geography, environmental science, urban planning, and agriculture.
- Apply techniques for data transformation, including projection, resampling, and georeferencing, to prepare spatial data for analysis.
- Retrieve spatial data from diverse sources, including remote sensing imagery, GPS data, and geographic databases.

- Utilize common analytical techniques for spatial data, such as spatial autocorrelation, interpolation, overlay analysis, and spatial clustering.
- Apply appropriate spatial analysis methods to address specific research questions and objectives.
- Develop and implement spatial models using software tools such as Geographic Information Systems (GIS) and statistical packages.
- Apply multivariate statistical techniques to analyze spatial data sets with multiple variables.
- Apply temporal analysis techniques to assess and analyze temporal trends, patterns, and dynamics in spatial phenomena.
- Utilize visualization techniques to represent spatial data effectively, including thematic mapping, cartographic design principles, and 3D visualization methods.
- Evaluate the quality and accuracy of spatial data sets and identify sources of error and uncertainty.
- Develop and present spatial analysis solutions to stakeholders, demonstrating the practical utility and relevance of spatial data analysis skills.

AG 6 Introduction to Soil Science (4 credit hours)   *Lecture/lab*

Fundamentals of soil formation, development, texture, structure, color, temperature, moisture, organisms, organic matter, chemical composition, clay minerals, classification, nutrient testing, fertilizer use, conservation, and management. Includes laboratory projects.

Course Competencies:

- Explain the processes and factors involved in soil formation, including weathering, erosion, deposition, and organic matter accumulation.
- Describe soil texture, structure, color, and their significance in soil classification and management.
- Understand the chemical composition of soils, including major and minor elements, pH, cation exchange capacity (CEC), and nutrient availability.
- Apply soil classification systems such as the USDA Soil Taxonomy to classify soils based on their physical, chemical, and morphological characteristics.
- Describe the diverse soil organisms and their roles in nutrient cycling, organic matter decomposition, soil structure formation, and plant-microbe interactions.
- Perform soil nutrient testing techniques to assess soil fertility status and nutrient deficiencies.
- Evaluate soil erosion processes and conservation practices to prevent soil degradation and maintain soil productivity.   *Field trip*
- Understand the importance of organic matter in soil fertility, structure, and water holding capacity.
- Develop soil management plans incorporating sustainable practices and addressing specific soil-related challenges.

AG 7 Applications of GIS in Agriculture (3 credit hours) *lecture/project*

Fundamental processes of geographic information systems (GIS) with application to agriculture.

File formats, database management, spatial analysis, and manipulation of data. Georeferenced data from mapping and yield monitoring.

Course Competencies:

- Define GIS and explain its significance in agriculture and spatial analysis.
- Identify common GIS file formats (e.g., shapefiles, GeoTIFFs, KML) and understand their characteristics and applications.
- Apply spatial analysis techniques such as buffering, overlay analysis, proximity analysis, and spatial interpolation in agricultural contexts.
- Manipulate and preprocess spatial data within GIS software, including data merging, clipping, projecting, and filtering.
- Integrate and analyze georeferenced yield monitoring data within GIS to identify spatial patterns and variability in crop yields.
- Apply cartographic principles to design informative and visually appealing maps for agricultural applications.
- Utilize GIS-based decision support tools to assist in agricultural planning, land management, crop selection, and precision agriculture practices.
- Utilize remote sensing tools and techniques within GIS to enhance spatial analysis and decision-making in agriculture.
- Apply GIS in agribusiness contexts, including farm management, precision agriculture, supply chain management, and market analysis.

AG 8 Precision Hardware Systems (2 credit hours)
Introduction to operation, troubleshooting, repair and calibration of precision agriculture components of auto-guidance systems, planters, combines, and application equipment.

Course Competencies:

- Identify and describe the key precision agriculture components, including auto-guidance systems, planters, combines, and application equipment.
- Explain the principles of operation and the role of each component in precision agriculture workflows.
- Demonstrate proficiency in operating precision agriculture equipment, including setting up and calibrating auto-guidance systems, planters, combines, and application equipment.
- Utilize troubleshooting techniques to diagnose problems systematically and efficiently, considering both mechanical and electronic aspects.
- Perform routine maintenance tasks to ensure the proper functioning and longevity of precision agriculture components.
- Demonstrate proficiency in repairing and replacing faulty components, following safety protocols and manufacturer guidelines.

AG 9 Agri-Business Seminar (1 credit hour)
Seminar designed to assist students dealing with the management and day-to-day decision making involved in the operation of an agricultural/agri-business firm.

AG 10 Introduction to Agricultural Economics (4 credit hours) _lecture_ [handwritten: 3]

Principles of economics as applied to agriculture; basic economic principles, finance, land, marketing, input allocation, pricing, international trade, agricultural policies, fiscal and monetary policies.

Course Competencies: [handwritten: Costing of Farmers $ + your company too!]

- Explain fundamental economic concepts such as supply and demand, opportunity cost, elasticity, and market equilibrium.
- Apply financial principles to agricultural business management, including budgeting, investment analysis, cost-benefit analysis, and risk assessment.
- Evaluate factors influencing resource allocation decisions in agriculture, including land, labor, capital, and technology.
- Analyze pricing mechanisms and strategies used in agricultural markets, including futures markets, auctions, and contracts.
- Analyze the impact of agricultural policies, including subsidies, tariffs, quotas, and trade agreements, on domestic and international agricultural markets.
- Understand the role of fiscal and monetary policies in shaping economic conditions and agricultural markets.
- Evaluate economic instruments and policies for promoting environmental sustainability in agricultural production and resource management.
- Critically evaluate agricultural policies and programs, including their objectives, effectiveness, and unintended consequences.

[handwritten left margin: "Global Awareness" / "Wildfires" Current Events / @ a project your job]

AG 11 Plant Pest Identification and Control (3 credit hours) _lecture_

Identification and control of weeds, insects, and diseases. Control methods include prevention, biological control, resistant varieties, and pesticides. Pesticide terminology, formulations, calibration, environmental concerns, safe handling, and laws and regulations concerning pesticides. Prerequisite: AG 1

Course Competencies:

- Identify common weed species, including characteristics such as leaf shape, growth habit, and reproductive structures.
- Recognition of major insect pests in agriculture, including their life cycles, feeding habits, and damage symptoms.
- Identification of common plant diseases, including symptoms such as leaf spots, wilting, and discoloration.
- Knowledge of preventive measures to minimize weed, insect, and disease infestations, such as crop rotation, sanitation practices, and quarantine procedures.
- Understanding of biological control methods, including the use of natural predators, parasites, and pathogens to manage pest populations.
- Ability to select and recommend resistant varieties based on pest pressure and environmental conditions.
- Understanding of key pesticide terminology, including terms such as active ingredient, formulation, mode of action, and persistence.

- Knowledge of different pesticide formulations (e.g., liquids, dusts, granules) and their properties, including solubility, volatility, and application methods.
- Proficiency in calibrating pesticide application equipment to ensure accurate and uniform application rates.
- Awareness of environmental risks associated with pesticide use, including contamination of water sources, impacts on non-target organisms, and pesticide resistance.
- Knowledge of proper handling, storage, and disposal of pesticides to prevent accidents and minimize human exposure.
- Familiarity with local, state, and federal laws and regulations governing pesticide use, storage, transportation, and disposal.
- Understanding of the principles of IPM, including the use of multiple control tactics in a coordinated and sustainable manner.

Comm /Private ? Pesticide app. licensed (won't be open book test anymore) 5yrs Add later

AG 12 Precision Data Analytics (3 credit hours) *Computer lab*
Advanced processes of data mining, analysis, reporting and interpretation of agriculture data from various precision agriculture platforms. Prerequisite: AG 7

Course Competencies:

- Ability to collect data from various precision agriculture platforms, including GPS-guided machinery, drones, sensors, and satellite imagery.
- Proficiency in preprocessing raw agricultural data to remove noise, handle missing values, and normalize data for analysis.
- Understanding of data fusion techniques to combine data from multiple sources for comprehensive analysis.
- Proficiency in applying advanced data mining techniques to agricultural datasets, such as classification, regression, clustering, and association rule mining.
- Understanding of algorithm parameters, model evaluation metrics, and hyperparameter tuning techniques.
- Ability to create thematic maps and analyze spatial patterns in crop yield, soil properties, and pest distribution.
- Ability to identify temporal patterns in crop growth, phenology, and environmental conditions.
- Skills in designing charts, graphs, and maps to effectively communicate data insights to stakeholders.
- Proficiency in generating comprehensive reports summarizing findings from agricultural data analysis, including key insights, trends, and recommendations.
- Ability to interpret findings from agricultural data analysis in the context of farm management decisions, such as crop planning, irrigation scheduling, and pest management.
- Understanding of ethical considerations related to agricultural data analysis, including data privacy, confidentiality, and informed consent.

AG 13 Commercial UAS Ground School (3 credit hours) *Lecture*
Prepares the student for FAA Commercial Unmanned Aircraft Systems (UAS) Pilot

Certification. Covers regulations, airspace, aerodynamics, weather, performance, registration, and aeromedical factors. Commercial UAS certification requires passing a FAA written exam.

Course Competencies:

- Knowledge of airspace classifications, restrictions, and requirements for UAS operations.
- Knowledge of airspace restrictions and how they impact UAS operations.
- Understanding of how aerodynamic factors influence UAS performance and handling characteristics.
- Ability to interpret weather reports, forecasts, and weather charts relevant to UAS flight.
- Knowledge of factors affecting UAS performance, such as weight and balance, density altitude, and battery life.
- Knowledge of the registration process and associated regulations.

AG 14 Soil Fertility and Fertilizers (3 credit hours) *Lecture//lab*

Use of fertilizers for peak production at optimum cost; evaluation and comparison of different forms of macro- and micro-nutrients, their manufacture, handling, and application; plant and soil chemistry. Prerequisite: AG 6

Course Competencies:

- Ability to identify nutrient deficiencies and excesses based on plant symptoms and soil analysis.
- Ability to evaluate the nutrient content, solubility, and release characteristics of various fertilizer formulations.
- Familiarity with safe handling practices for storing, transporting, and applying fertilizers.
- Understanding of different methods of fertilizer application, including broadcasting, banding, foliar spraying, and fertigation.
- Ability to calculate fertilizer application rates based on crop nutrient requirements and soil test results.
- Understanding of basic soil chemistry principles, including soil pH, cation exchange capacity (CEC), and nutrient cycling.
- Understanding of best management practices (BMPs) to minimize nutrient loss and environmental degradation.
- Knowledge of strategies for maximizing fertilizer efficiency and return on investment.
- *Lab→* Hands-on experience in fertilizer application techniques through field demonstrations or laboratory exercises.

AG 15 Remote Sensing Applications (3 credit hours) *Lecture or lab?*

Introduction to the characteristics of various sensors, data collection and analysis applicable to remote sensing applications with traditional aerial platforms and civil unmanned aerial system (UAS) operations.

Heartland Ag could help

Course Competencies:

- Understanding the basic principles of remote sensing, including electromagnetic radiation, spectral signatures, and interaction with Earth's surface features.
- Knowledge of the characteristics, capabilities, and limitations of different sensor types.
- Understanding the process of data collection using traditional aerial platforms (e.g., manned aircraft) and civil unmanned aerial systems (UAS).
- Ability to conduct qualitative and quantitative analysis of remote sensing data to extract meaningful information about land cover, land use, and environmental variables.
- Understanding the diverse applications of remote sensing across various fields, including agriculture, forestry, urban planning, environmental monitoring, and disaster management.
- Ability to perform geospatial analysis, such as image classification, change detection, and terrain modeling, using remote sensing and GIS techniques.
- Understanding of legal frameworks governing remote sensing activities, including regulations related to data ownership, intellectual property rights, and airspace management.
- Practical experience in using remote sensing software packages for data processing and analysis.

AG 16 Internship (3 credit hours)

AG 17 Agricultural Salesmanship (3 credit hours)
Role, dynamics, and principles of sales communications as related to food and agriculture; methods for analyzing, setting objectives, planning, conducting, and evaluating sales communications efforts; sales presentations.

Course Competencies:

- Knowledge of the structure, trends, and dynamics of the food and agriculture sectors.
- Knowledge of communication styles, listening skills, and non-verbal communication cues relevant to sales interactions.
- Awareness of ethical considerations and best practices in sales communication within the food and agriculture context.
- Knowledge of quantitative and qualitative methods for assessing sales performance and progress towards objectives.
- Familiarity with strategic planning frameworks for developing sales communication plans.
- Proficiency in preparing and delivering compelling sales presentations tailored to the needs and interests of potential buyers.
- Ability to handle objections, answer questions, and address concerns raised during sales presentations.

Precision Agriculture
Program Advisory Council
Equipment Dealers
Minutes
June 6, 2024

I. Introductions

Those present were Kelly Holting (high school agriculture teacher/consultant), Mike Crouch (FHTC Vice President of Advancement), Corey Spikes (FHTC Director of Economic Partnerships), Kim Dhority (FHTC Dean of Academic Affairs). Gabe Gantz (Modern Ag), Richard Dugan (Kan Equip) and Nik Roth (Prairie Land Partners John Deere)

II. Curriculum

The final curriculum mapping had been sent to all members of the program advisory committee. We reviewed the curriculum with the attendees at this meeting.

III. Equipment and Software Needs

Needed equipment, software and other items were discussed with the dealers. The following is a list of items that were brought to our attention and used for budgeting purposes.

- Setting up laptops with siftware Companies have programs with
- Bring over tractor that has the system from the dealer.
- Bought older equipment and Gabe helped update,'
- Get older equipment and load software. It doesn't have to be large scale. The guidance software can be
- Go out and see the large-scale work at dealerships.
- Work with vendors to get equipment that has been traded. Many times, this equipment cannot be sold.
- Windows computers... nothing robust.
- Soil labs Serv a Tec or Midwest Labs. Cory has connection at ServATec, 360 yield has a nitrogen tester
- Crop Quest is another source.
- Software Classroom Hardware
- Talk to Casey about Drones. Company come in to do demo.
- GIS systems Ag Leader $2000 a year Mobile license
- Mobile handheld items Windows with GPS to do field studies,
- Display simulator package $4200 Also access to their resources,
- Gabe will send us a list of vendors.
- HME welders

- 40 x 60 Building similar to welding building
- Greenhouse
- Side by Side for the program.
- Crop Quest
- SMS SST