***INDIANA FFA ORGANIZATION***

Agricultural Technology

*CAREER DEVELOPMENT EVENT*

# PURPOSE:

The purpose of the agricultural technology career development event is to provide individuals with practical skills necessary to pursue career opportunities in precision agriculture. Careers in precision agriculture are in high demand and students with fundamental knowledge in how technology in agriculture works will be well suited for future employment.

# GENERAL CAREER DEVELOPMENT EVENT RULES:

* 1. FFA Official Dress is not required for this event. Please wear clothing that ensures proper safety during the event.
  2. Chapters may have more than one team compete in the test pilot event.
  3. All students must be active FFA members in good standing in order to compete. In order to be an active member in good standing, a student must:
     + Be enrolled in at least one agricultural education course during the school year,
     + Attend meetings, strive for degrees of membership, and participate in other organized activities of the chapter,
     + Pay all current state and national dues, and
     + Display conduct consistent with the ideals and purposes of the National FFA Organization. More information on active membership is available [here.](http://www.inffa.org/docs/53740_Active%20Main%20Info%2015.pdf)
  4. Participants using personal electronic communication devices, other than those approved by the event officials, during the course of the event are subject to disqualification. Cell phones are not allowed to be used during the event.
  5. The use of live animals is strictly prohibited.
  6. The use of weapons is prohibited. The list includes, but is not limited to guns, knives, bullets, bows, and arrows.
  7. Individuals are not eligible to compete the year after winning the state event. The chapter that has won first place in the state is eligible to participate in the event the year immediately following the winning of first place provided that the team is composed of entirely different members. A state- winning team can sit out one year and compete the following year with the original winning members so long as they still meet the membership and other Career Development Event participation requirements. The winning team during the 2022 test pilot is allowed to compete the following year.
  8. This Career Development Event is open only to those FFA members in their 9-12 grade years of high school.

# EVENT RULES:

* 1. Teams will consist of four members.
  2. Team members will work together to prepare a written recommendation and email response to a farmer based on the scenario provided.
  3. During the practicum portion of the event, one team member will be responsible for completing a UAV Obstacle Course, one member will complete a Scratch Programming Event, one team member will complete a GIS Mapping and Flight Plan Event and one team member will complete an Analysis and Evaluation of Data.

# EVENT FORMAT

All teams will meet in a central location for an orientation. Individual Practicums will take place before the team activity. Teams will be seated by practicum group. All team members will be given an orientation at the beginning of the practicum.

1. Equipment
   1. A computer will be provided for all events. No personal or school laptops will be allowed.
   2. Pencils will be provided for use during the quiz portion of the event.
   3. Mini I-pads will be provided for use as controllers during the UAV Obstacle Course. A participant may provide their own mini I-pad as long as the appropriate software is installed (Tellos Ryze app).
   4. Software programs required: Drone Deploy (a 1 year subscription will be provided), Google Earth Pro, Tellos Ryze App, Scratch, Node, Microsoft Office, PDF
2. Team Activity- Recommendation to Customer (200 points possible per team)
   1. Team members will act as a precision agriculture specialist with a large farmer customer base. The scenario will be to provide a recommendation to a farmer on which corn hybrids he should plant based on data provided. Students will be provided a spreadsheet/report with yield data, yield map, soil map, and planting data from a test plot. Team members will utilize the data points to determine which seed hybrids will yield the best performance and then make a recommendation with justification for the top 3 hybrids that are recommended. The recommendation should be formatted in Microsoft Word and exported into a PDF to be attached to a professionally written email to the farmer.
   2. The recommendation must include the following information:
      1. State the top 3 hybrids you recommend
      2. Reference data provided to justify why you selected those 3 hybrids
      3. Highlight customer needs
   3. The email must be professionally written within the Google Forms template provided.
3. Individual Activities- Written Quiz (50 points possible per individual, 150 points possible per team, lowest score will be dropped)
   1. Part 107A quiz: A scantron format will be used for members to complete a 25 question quiz over content covered in the Part 107A exam. Each question is worth 2 points for a total of 50 points.
   2. Each team member will take a 25 question quiz covering information that is included in the FAA Part 107A test and identify components of a UAV. The quiz will consist of 20 questions from Part 107 A test and will be administered via Scantron with 3 options for responses (ABC) similar to the actual Part 107A test.
   3. There will be 5 questions asking students to identify components of a UAV.
4. Individual Activities- Practicums (100 points possible per individual, 400 points possible per team)

The practicums will consist of four individual events. Each team must assign one member to each of the following areas prior to the contest:

* 1. UAV Obstacle Course
  2. Scratch Programming with Tellos EDU
  3. GIS Mapping and Flight Plan
  4. Analysis and Evaluation of Data

1. UAV Obstacle Course:

Students will use a Ryze Tello drone to fly an indoor obstacle course timed event. Participants will be given 10-minutes to set up and prepare the UAV. The UAV will be charged to 100% and a mini-iPad will be provided as the controller. No cell phones are allowed to be used as a controller. Participants will be given up to 10-minutes to complete the obstacle course. The objective is to complete the obstacle course with accuracy and speed. This is a timed event.

Materials provided: Tellos UAV, mini iPad with Tello app installed

Obstacle course will be revealed on day of competition and skills subject to change.

Minimum skills required --

The UAV pilot must navigate the drone:

o Over obstacles

o Under obstacles

o Through obstacles

o Orbit object(s) while focusing on the object

o Around obstacles

o Take-off and Land in a confined space.

o Practice flying in a safe and professional manner

1. Scratch Programming:

Students will program a Tellos EDU to follow a predefined pattern or a specific task that will be provided at the event. Students will be evaluated on the successful completion of the pattern or task as well as the code that was created. The Tellos EDU are provided and charged to 100%. No cell phones are allowed to be used. Participants will be given 40 minutes to program and complete pattern or task.

Materials provided: Tellos EDU, laptop with Scratch and Node installed, javascript and s2e files

Patterns will be revealed on day of competition

Minimum skills required --

* + Import the s2e file into scratch to load tello controls
  + Establish a connection between Scratch and Tello EDU
  + Construct manual controls through Scratch
  + Build a predetermined pattern through Scratch
  + Execute a predetermined pattern through Scratch

1. GIS Mapping and Flight Plan:

Students will use Google Earth Pro to map and set a field boundary, determine latitudes and longitudes, measure distance and calculate area (acres, square feet) with polygon and vector data and export data from Google Earth Pro. Students will also create a flight plan using Drone Deploy. Students will need to create an autonomous flight plan with appropriate overlaps and flight altitude. Participants will have 1 hour to complete the practicum.

Materials provided: laptop, Drone Deploy, Google Earth Pro

1. Analysis and Evaluation of Data:

Students will be given a Drone Deploy flight map and will be asked questions about the data and map to determine their ability to analyze and understand the information. Information such as image quality, adding annotations and interpreting the data in the map is important. Drone Deploy will be utilized to add annotations and exported to Excel. The information for this practicum will be pre-loaded on a computer at the event.

Materials provided: laptop, Drone Deploy, Microsoft Excel and Word

## SCORING

Weighted rank scoring will be implemented to maintain point value emphasis between individual and team events. The criteria and points can be found on the scorecards in Appendix B.

Event Points:

Team Activity- 200

Part 107A Quiz- 150

(lowest team member score will be dropped on the quiz)

Practicums- 400

Awards:

Top 4 Teams

Top 4 Individuals

## TIEBREAKERS

## Team tiebreakers will be settled in the following order:

1. Combined individual practicum rank score.
2. Combined individual quiz score.

## Individuals tiebreakers will be settled in the following order:

1. Practicum score.
2. Part 107A quiz score.

## CONTACT

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