

# AOPA and Purdue University

## Building Aviation into High Schools through Aviation STEM Curriculum

Jim Brown, Jim Greenan, Julius Keller, Bernie Wulle  
Introductory Presentation  
Fall 2016



# INTRODUCTION

## OUTLINE

- Introduction of the Team
- Brief Overview of Purdue
- Project Goals
- Project Objectives
- Conceptual Framework
- Outcomes and Products
- Support and Advisory Council
- Project Management Plan



# Introduction to the Team

## **Synergy and Expertise**



# TEAM MEMBERS

## **Bernie Wulle, Project Director**

- Professor, School of Aviation Transportation and Technology, Purdue
- Designated Pilot Examiner
- Developed a joint program with Able Flight for the purpose of enabling physically disabled individuals to learn to fly.
- Developed a program with regional airlines that will provide students the background and skills allowing a new graduate to become a successful line pilot.

## **Julius Keller, Assistant Director**

- Post-Doctoral Researcher (SATT)
- Certified Flight Instructor
- Participated in numerous projects to attract the next generation of aviation professionals
- Accreditation Committee
- Research Interests
  - Aviation Education and Training
  - Aviation Safety & SMS Policy
  - UAV Policy and Perceptions

# TEAM MEMBERS

## Jim Greenan

- Professor and Chair, Career and Technical Education, Purdue University
- Director, (Teacher in) Business and Industry Internship Program
- Expertise: Quantitative methods and program evaluation, instructional methods and curriculum development, Generalizable Skills Instruction, and Special Needs Learners in CTE programs and the workforce
- Director, Leadership Development Programs (LDPs) in Advanced Manufacturing Education, Career Education, Career Pathways, Generalizable Skills Instruction, Special Needs Education, and Work-Based Learning

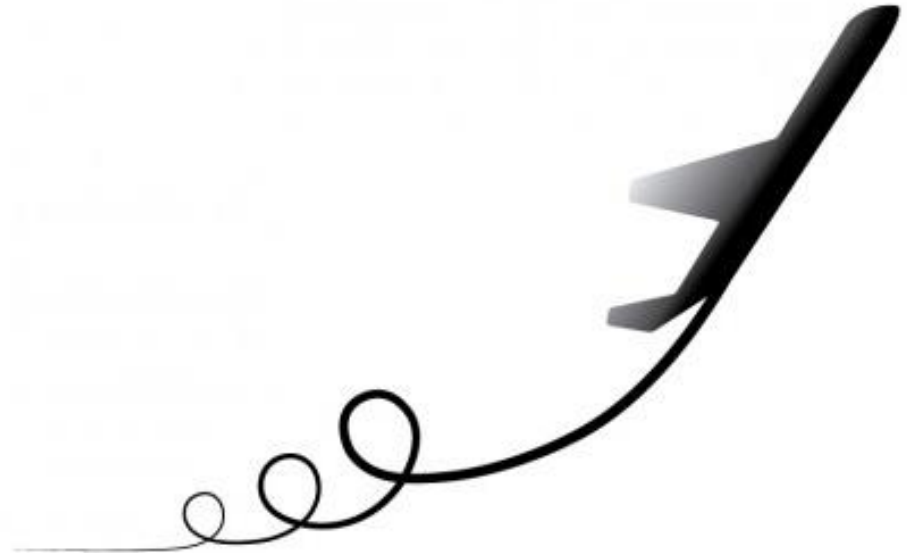
## Jim Brown

- Recently Retired Full Professor  
Department of Organizational Leadership,  
Policy, & Development at University of  
Minnesota.
  - Director of Graduate Studies
  - Coordinator Work-Based Learning Program
  - Interagency Collaborative Specialist
  - Accommodations of Special Needs Learners in CTE
- Commercial-Instrument-Single Engine Land
- Building Vans RV-12, completion projected for 10-2016

# TEAM MEMBERS

## SYNERGY

- Over 90 years of combined expertise within aviation and education.
- Worked on several projects together.
- Successfully completed multiple collaborative interdisciplinary projects with global recognition.
- Committed to serve project sponsors with excellence.



# ADVISORY COUNCIL

## PERSPECTIVES REPRESENTED ON ADVISORY COUNCIL

- Educators
- Aviators with Disabilities
- High School STEM Aviation Teacher
- High School CTE Educator
- High School Administrator
- High School STEM Aviation Student
- High School Guidance Counselor
- Community/Technical College Aviation Program
- University Aviation Program
- General Aviation
- Gender Neutrality in Aviation
- AOPA
- FAA
- Business Aviation
- STEM Systems Overview
- Science
- Technology
- Engineering
- Math
- Instructional Technology
- Instructional Accommodations
- State Education Agency

# Brief Overview of Purdue





# PURDUE UNIVERSITY

## OVERVIEW



- Purdue University is the State of Indiana's land-grant university and a Carnegie Foundation tier-one research institution.
- Includes top ten departments in nearly every one of its 10 colleges at the West Lafayette campus.
- Highly motivated faculty and staff.

# **Project Goals and Objectives**



# PROJECT GOALS

- To increase the awareness of aviation within secondary schools.
- Inspire, motivate, and engage high school students to achieve their academic/career goals.
- Assist in providing the aviation industry with competent young aviation professionals of with diverse backgrounds to increase the numbers going into aviation.
- Provide opportunities for preparing high school students for collegiate studies in aviation/aerospace.

# PROJECT OBJECTIVES

- Create curriculum for 9<sup>th</sup> to 12<sup>th</sup> grade pathways in four areas: Pilot, Aerospace Engineering, Aviation Technology and Unmanned Aerial Systems
- Develop comprehensive curricula
  - Lesson plans, teacher materials, student activities, assessments, etc.
- **Produce opportunities for cooperative and problem-based learning.**
- Continue to seek opportunities for improvement and enhancement.
- Assist in recruitment, advancement, and implementation.

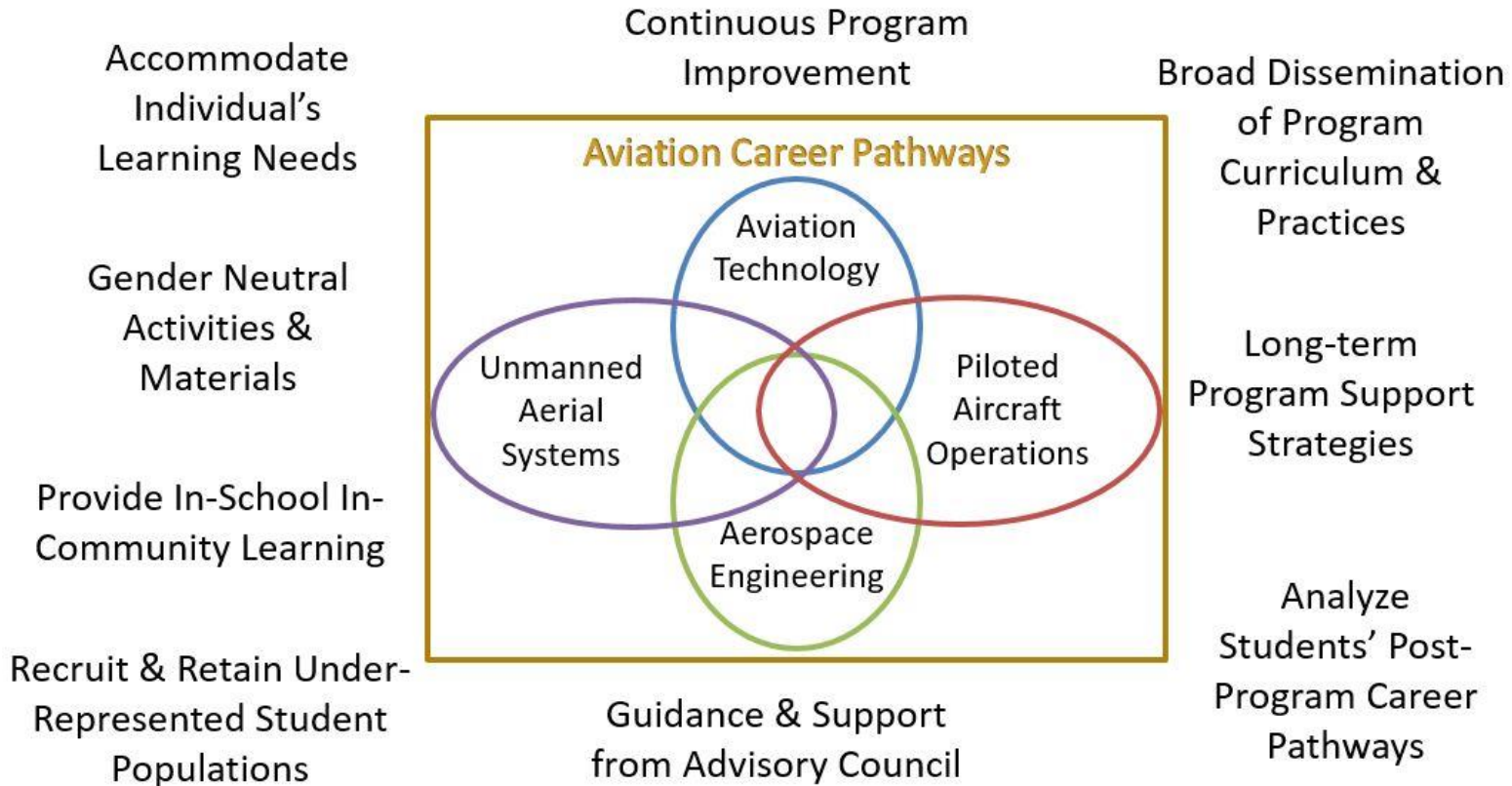


# Conceptual Framework



# CONCEPTUAL FRAMEWORK

## KEY PRIORITIES OF AVIATION-RELATED HIGH SCHOOL STEM CURRICULUM



# Outcomes and Products



# OUTCOMES

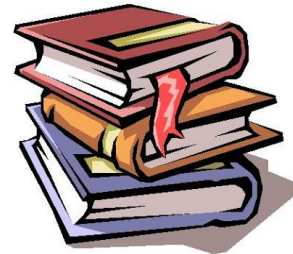
- An aviation career pathway created with multiple levels of support and feedback.
- Can be used by high schools nationwide.
- National publicity for the purpose of attracting secondary students to aviation.
- Workforce data collection for reporting trends, issues, and processes regarding aviation career pathways.
- Opportunity for students to join this international industry.



# METHOD FOR DISSEMINATING CURRICULUM

## GETTING TO THE SCHOOLS

- AOPA High School Initiative
- CTE Conferences
- Workshops
- Publications and web-based materials
- Academic and industry outlets



# FIELD TEST REQUIREMENTS

- Commit to at least one pathway for at least the entire four years course sequence
- Commit to running a course for the entire year
  - *Ongoing input and feedback*
  - Longitudinal Studies
- This Curriculum is designed to be modular
- Teacher who will teach the course(s) will participate in professional development if no experience in aviation or teaching aviation related courses.



# Project Plan

## By Year



# Grade Objectives

9<sup>th</sup> grade

10<sup>th</sup> grade

11<sup>th</sup> grade

12<sup>th</sup> grade

**Pilot**

**Aerospace  
Engineering**

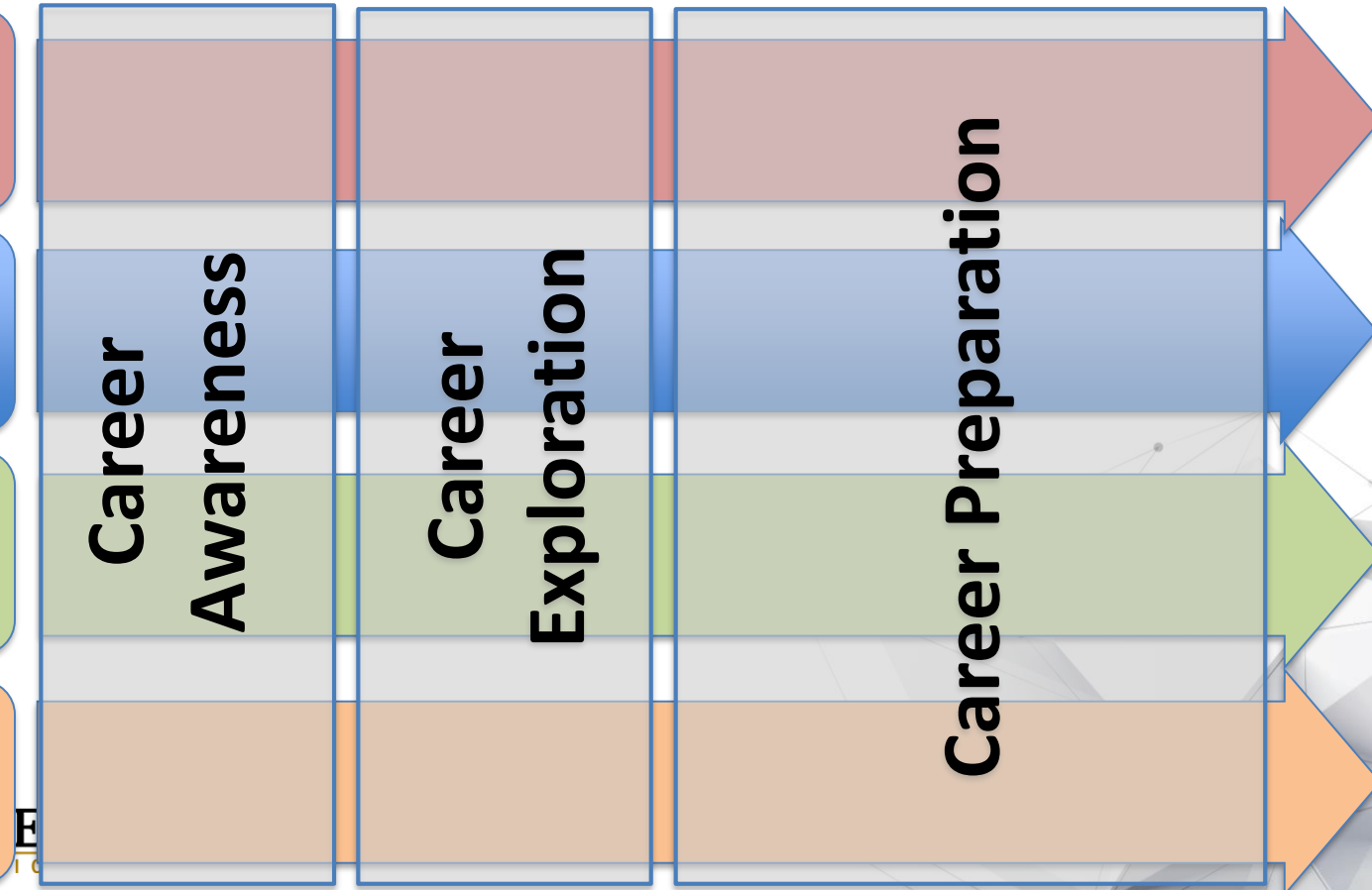
**UAS  
(drones)**

**Aviation  
Technology**

**Career  
Awareness**

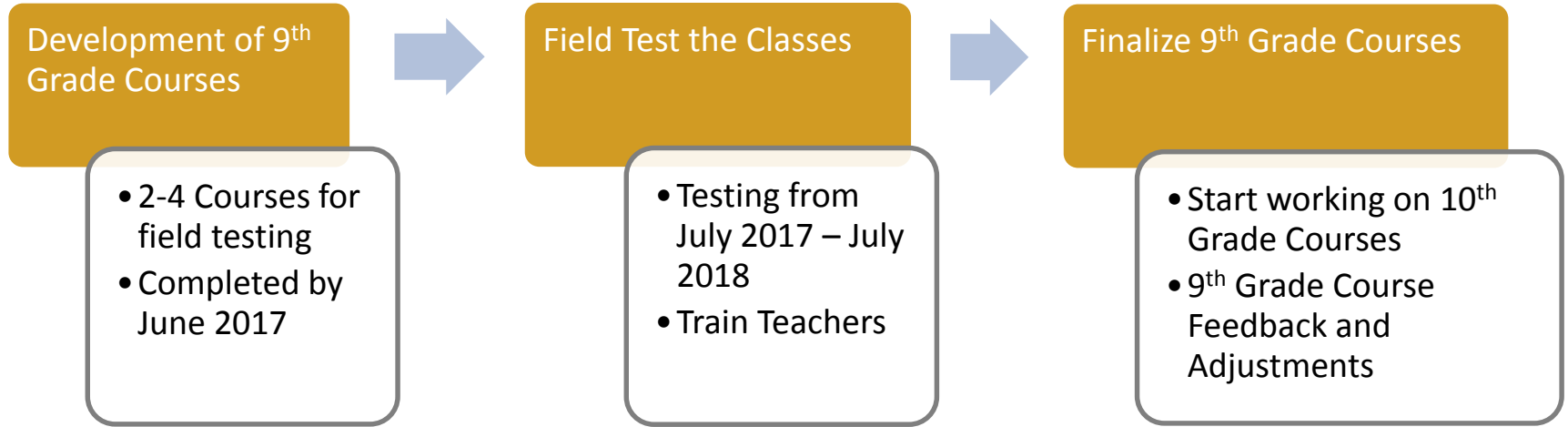
**Career  
Exploration**

**Career Preparation**



# TIMELINE

STARTING AUGUST 2017



Once the 9<sup>th</sup> grade course are complete, the team will begin the 10<sup>th</sup> grade courses...and so on.

# Development Timeline

	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
9 <sup>th</sup>	Develop Courses	Field Test	Implement			
10 <sup>th</sup>		Develop Courses	Field Test	Implement		
11 <sup>th</sup>			Develop Courses	Field Test	Implement	
12 <sup>th</sup>				Develop Courses	Field Test	Implement

# Thank You!

## Questions? Comments?

