

COVER SHEET FOR PROPOSAL TO THE NATIONAL SCIENCE FOUNDATION

PROGRAM ANNOUNCEMENT/SOLICITATION NO./ DUE DATE NSF 24-584 10/02/2025		Special Exception to Deadline Date Policy		FOR NSF USE ONLY	
FOR CONSIDERATION BY NSF ORGANIZATION UNIT(S) (Indicate the most specific unit known, i.e. program, division, etc.) DUE - ATE-Consortia				NSF PROPOSAL NUMBER 2600147	
DATE RECEIVED	NUMBER OF COPIES	DIVISION ASSIGNED	FUND CODE	UEI(Unique Entity Identifier)	FILE LOCATION
10/01/2025	1	11040000 DUE		HSXANJ7LWMX4	
EMPLOYER IDENTIFICATION NUMBER (EIN) OR TAXPAYER IDENTIFICATION NUMBER (TIN)		SHOW PREVIOUS AWARD NO. IF THIS IS ☐ A RENEWAL ☐ AN ACCOMPLISHMENT-BASED RENEWAL		IS THIS PROPOSAL BEING SUBMITTED TO ANOTHER FEDERAL AGENCY? YES ☐ NO ☒ IF YES, LIST ACRONYM(S)	
NAME OF ORGANIZATION TO WHICH AWARD SHOULD BE MADE WICHITA STATE UNIVERSITY CAMPUS OF APPLIED SCIENCES & TECHNOLOGY			ADDRESS OF AWARDEE ORGANIZATION, INCLUDING 9 DIGIT ZIP CODE 4004 N WEBB RD WICHITA,KS 67226 US		
AWARDEE ORGANIZATION CODE (IF KNOWN)					
NAME OF PRIMARY PLACE OF PERF WICHITA STATE UNIVERSITY CAMPUS OF APPLIED SCIENCES & TECHNOLOGY			ADDRESS OF PRIMARY PLACE OF PERF, INCLUDING 9 DIGIT ZIP CODE 4004 N WEBB RD WICHITA,KS 67226 US		
IS AWARDEE ORGANIZATION (Check All That Apply)		☐ SMALL BUSINESS ☐ FOR-PROFIT ORGANIZATION		☐ MINORITY BUSINESS ☐ WOMAN-OWNED BUSINESS	
					☐ IF THIS IS A PRELIMINARY PROPOSAL THEN CHECK HERE
TITLE OF PROPOSED PROJECT					SHOW LETTER OF INTENT ID IF APPLICABLE
REQUESTED AMOUNT \$ XXXXXXXXXX		PROPOSED DURATION (1-60 MONTHS) 36 months		REQUESTED STARTING DATE 07/01/2026	
				SHOW RELATED PRELIMINARY PROPOSAL NO. IF APPLICABLE	
THIS PROPOSAL INCLUDES ANY OF THE ITEMS LISTED BELOW					
☒ TYPE OF PROPOSAL <u>Research</u> ☐ COLLABORATIVE STATUS _____ ☐ BEGINNING INVESTIGATOR ☐ DISCLOSURE OF LOBBYING ACTIVITIES ☐ PROPRIETARY & PRIVILEGED INFORMATION ☐ HISTORIC PLACES ☐ LIVE VERTEBRATE ANIMALS IACUC App. Date _____ PHS Animal Welfare Assurance Number _____			☒ HUMAN SUBJECTS Human Subjects Assurance Number _____ Exemption Subsection _____ or IRB App. Date pending ☐ FUNDING OF INT'L BRANCH CAMPUS OF U.S. IHE ☐ FUNDING OF FOREIGN ORGANIZATION OR FOREIGN INDIVIDUAL ☐ INTERNATIONAL ACTIVITIES: COUNTRY/COUNTRIES INVOLVED _____ ☐ POTENTIAL LIFE SCIENCES DUAL USE RESEARCH OF CONCERN ☐ OFF-CAMPUS OR OFF-SITE RESEARCH ☐ POTENTIAL IMPACTS ON TRIBAL NATIONS		
PI/PD DEPARTMENT		PI/PD POSTAL ADDRESS 4004 N Webb Rd			
PI/PD FAX NUMBER		Wichita,KS 67226 US			
NAMES(TYPED)	High Degree	Yr of Degree	Telephone Number	EmailAddress	
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CO-PI/PD Michael R Sasso	AS	1985	630-938-0333	Michael.Sasso@aims.edu	
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CO-PI/PD Aaron Brenwald	AS	2015	316-677-1948	abrenwald@wsutech.edu	

CERTIFICATION PAGE**Certification for Authorized Organizational Representative (or Equivalent)**

By electronically signing and submitting this proposal, the Authorized Organizational Representative (AOR) is: (1) certifying that statements made herein are true and complete to the best of the individual's knowledge; and (2) agreeing to accept the obligation to comply with NSF award terms and conditions if an award is made as a result of this proposal. Further, the proposer is hereby providing certifications regarding conflict of interest, flood hazard insurance, responsible and ethical conduct of research, organizational support, and safe and inclusive working environments for off-campus or off-site research, as set forth in the NSF Proposal & Award Policies & Procedures Guide (PAPPG). Willful provision of false information in this application and its supporting documents or in reports required under an ensuing award is a criminal offense (U.S. Code, Title 18, Section §1001).

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Certification Regarding Flood Hazard Insurance

Two sections of the National Flood Insurance Act of 1968 (42 U.S.C § 4012a and § 4106) bar Federal agencies from giving financial assistance for acquisition or construction purposes in any area identified by the Federal Emergency Management Agency (FEMA) as having special flood hazards unless the: (1) community in which that area is located participates in the national flood insurance program; and (2) building (and any related equipment) is covered by adequate flood insurance. By electronically signing the Certification Pages, the Authorized Organizational Representative (or equivalent) located in FEMA-designated special flood hazard areas is certifying that adequate flood insurance has been or will be obtained in the following situations: (1) for NSF awards for the construction of a building or facility, regardless of the dollar amount of the award; and (2) for other NSF awards when more than \$25,000 has been budgeted in the proposal for repair, alteration or improvement (construction) of a building or facility.

Certification Regarding Responsible and Ethical Conduct of Research (RECR)

(This Certification applies to proposals submitted prior to July 31, 2023, and is not applicable to proposals for conferences, symposia, and workshops.)

By electronically signing the Certification Pages, the Authorized Organizational Representative is certifying that, in accordance with the NSF Proposal & Award Policies & Procedures Guide, Chapter IX.B., the institution has a plan in place to provide appropriate training and oversight in the responsible and ethical conduct of research to undergraduates, graduate students and postdoctoral researchers who will be supported by NSF to conduct research. The AOR shall require that the language of this certification be included in any award documents for all subawards at all tiers.

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Certification Regarding Organizational Support

By electronically signing the Certification Pages, the Authorized Organizational Representative (or equivalent) is certifying that there is organizational support for the proposal as required by Section 526 of the America COMPETES Reauthorization Act of 2010. This support extends to the portion of the proposal developed to satisfy the Broader Impacts Review Criterion as well as the Intellectual Merit Review Criterion, and any additional review criteria specified in the solicitation. Organizational support will be made available, as described in the proposal, in order to address the broader impacts and intellectual merit activities to be undertaken.

Certification Regarding Dual Use Research of Concern

By electronically signing the certification pages, the Authorized Organizational Representative is certifying that the organization will be or is in compliance with all aspects of the United States Government Policy for Institutional Oversight of Life Sciences Dual Use Research of Concern.

Certification Requirement Specified in the William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021, Section 223(a)(1) (42 USC 6605(a)(1))

By electronically signing the Certification Pages, the Authorized Organizational Representative is certifying that each individual employed by the organization and identified on the proposal as senior/key personnel has been made aware of the certification requirements identified in the William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021, Section 223(a)(1) (42 U.S.C § 6605(a)(1)).

Certification Regarding Safe and Inclusive Working Environments for Off-Campus or Off-Site Research

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Certification Regarding Malign Foreign Talent Recruitment Programs

By electronically signing the Certification Pages, the Authorized Organizational Representative is certifying that, in accordance with Section 10632 of the CHIPS and Science Act of 2022 (42 U.S.C. 19232), all senior/key personnel associated with the proposal have been made aware of and have complied with their responsibility under that section to certify that they are not a party to a malign foreign talent recruitment program.

AUTHORIZED ORGANIZATIONAL REPRESENTATIVE		SIGNATURE	DATE
NAME Kelley Klecker		Electronic Signature	Oct 01 2025 04:27 PM
TELEPHONE NUMBER 316-512-7184	EMAIL ADDRESS kklecker@wsutech.edu	FAX NUMBER	

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AWARDEE ORGANIZATION CODE (IF KNOWN)					
NAME OF PRIMARY PLACE OF PERF Clemson University			ADDRESS OF PRIMARY PLACE OF PERF, INCLUDING 9 DIGIT ZIP CODE 201 SIKES HALL CLEMSON, SC 29634-0001 US		
IS AWARDEE ORGANIZATION (Check All That Apply)		☐ SMALL BUSINESS ☐ FOR-PROFIT ORGANIZATION		☐ MINORITY BUSINESS ☐ WOMAN-OWNED BUSINESS	
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PI/PD DEPARTMENT		PI/PD POSTAL ADDRESS 300 BRACKETT HALL BOX 345702 CLEMSON, SC 296340001 US			
PI/PD FAX NUMBER					
NAMES(TYPED)	High Degree	Yr of Degree	Telephone Number	EmailAddress	
PI/PD NAME					
CO-PI/PD					
CO-PI/PD					
CO-PI/PD					
CO-PI/PD					

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AUTHORIZED ORGANIZATIONAL REPRESENTATIVE		SIGNATURE	DATE
NAME Terry H Rumph		Electronic Signature	Oct 01 2025 04:28 PM
TELEPHONE NUMBER 864-656-5533	EMAIL ADDRESS terryr@clemson.edu	FAX NUMBER	

Division of Undergraduate Education

Project Data Form

Project Information

Name of Principal Investigator/Project Director: **James R Hall**

Name of Primary Organization: **WICHITA STATE UNIVERSITY CAMPUS OF APPLIED SCIENCES &**

SAM Legal Business Name: **WICHITA STATE UNIVERSITY CAMPUS OF APPLIED SCIENCES & TI**

Program Information

Program-track to which the proposal is submitted: **ATE-Consortia**

Category: **Project--Curriculum and Ed. Materials Devel. (B)**

Prime Organization Information

Highest Degree: **Associate (A)**

Institution Type: **Public (PUBL)**

Project Data

1. Discipline: **Education**

Subdiscipline: **Career and Technical Education**

2. Discipline: **Transportation**

Subdiscipline: **Mobility**

3. Discipline: **Games, Simulation, and AR-VR**

Subdiscipline: **Extended Reality (XR)**

4. Discipline: **Education**

Subdiscipline: **Curriculum and Instruction**

5. Discipline: **Education**

Subdiscipline: **Online Learning**

Primary Academic Focus Level: **PreK-12 and Undergraduate (AL)**

Private Sector Participation: **Yes. The proposed project will have private sector participation (PS).**

Audience(s):

1. **Faculty Professional Development (F)**
2. **Secondary School Students (S)**
3. **Technicians and Technologists (H)**
- 4.
- 5.
- 6.
- 7.
- 8.

Strategic Area:

Project Feature(s):

1. **Educational Uses of Technology (3)**
2. **Integration of Research and Education (2)**
3. **Science Literacy for Non-STEM Majors (6)**
- 4.
- 5.

Estimated Number of Individuals Involved

Estimated number of individuals in each of the following categories to be directly affected by the activities of the project during its operation:

PreK-12 Students: **500**

PreK-12 Teachers: **100**

Undergraduate Students: **200**

Graduate Students: **2**

Postdoctoral Fellows: **0**

Higher Education Faculty: **4**

Other Organizations

Other Organizations involved in the project's operation:

1. **Clemson University**
2. **Aims Community College**

3. Calhoun Community College

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Division of Undergraduate Education

Project Data Form

Project Information

Name of Principal Investigator/Project Director: **Kapil Chalil Madathil**

Name of Primary Organization: **Clemson University**

SAM Legal Business Name: **CLEMSON UNIVERSITY**

Program Information

Program-track to which the proposal is submitted: **ATE-Consortia**

Category: **Project--Curriculum and Ed. Materials Devel. (B)**

Prime Organization Information

Highest Degree: **Doctorate (D)**

Institution Type: **Public (PUBL)**

Project Data

1. Discipline: **Education**

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Subdiscipline: **Mobility**

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Strategic Area: **Not yet specified by the lead proposal**

Project Feature(s):

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Project Summary

OVERVIEW

Avionics, defined as the integration of advanced electronic systems for navigation, communication, surveillance, flight control, and safety, represents a rapidly growing and strategically vital sector of aviation. With avionics technician employment projected to grow by 11% over the next two decades and nearly half of the current workforce expected to retire within the next decade, the need for a robust pipeline of highly skilled avionics professionals is urgent. **Wichita State University Campus of Applied Sciences and Technology (WSU Tech)**; together with **Aims Community College (ACC)** in Greeley, Colorado; **Calhoun Community College (CCC)** in Decatur, Alabama; and Clemson University's **NSF ATE Center for Aviation and Automotive Technological Education Using Virtual E-Schools (CA²VES)** in South Carolina, proposes: *Collaborative Research: AVIATE: Advancing AVionics in American Technical Education, A National ATE Consortium*. Through AVIATE, the consortium will create and integrate evidence-based curricula, deploy immersive learning technologies, align programs with industry-defined competencies, and implement avionics content across participating institutions.

The AVIATE project has four primary objectives: 1) identify current and emerging workforce requirements for avionics technicians; 2) design and assess an innovative avionics curriculum; 3) broaden and strengthen the avionics technician pipeline; and 4) build instructor capacity and national networks. The AVIATE consortium partners will accomplish these objectives by collaborating with industry partners to validate the knowledge, skills, and abilities required of avionics technicians to support advanced technology aircraft. The consortium will develop new avionics learning modules in hybrid formats, with the inclusion of extended reality (XR) simulations. Recruitment and retention strategies will expand participation in avionics programs, with a focus on two-year college students, high school students, and incumbent workers. The anticipated impact is a significant increase in the number of avionics technicians trained and equipped to adapt to rapid innovation and lifelong learning demands.

INTELLECTUAL MERIT

The AVIATE consortium will address workforce needs and improve student learning in avionics technician education and training through innovative and evidence-based avionics curriculum and the mitigation of educational disruptions. The consortium will deliver a transformative, scalable, and flexible hybrid curriculum using a combination of digital learning and hands-on laboratory experiences. At the core of this effort is the integration of extended reality (XR), inclusive of virtual reality and augmented reality and artificial intelligence (AI) into avionics technician education. Based on Bloom's taxonomy, XR simulations will immerse students in authentic avionics tasks in a safe, simulated environment. This hybrid approach will allow avionics technician education to be available for students regardless of the educational climate. The efficacy of the hybrid instructional approach will be evaluated based on the extent to which the curriculum is aligned with current and future workforce needs and students demonstrate skill mastery. Flexible, efficient, and scalable education has the potential to help address the need for crisis preparation and provide access to all individuals regardless of geography while increasing the available workforce for the nation's tech industries. All AVIATE project findings and resources will be broadly disseminated on ATE Central and the EducateWorkforce platform to ensure broad transfer of knowledge.

BROADER IMPACTS

The AVIATE project directly responds to feedback from secondary and postsecondary education, industry, and national workforce data highlighting the urgent need to expand the pipeline of avionics technicians, thus improving aircraft longevity and ensuring the United States' economic competitiveness. The project strengthens defense readiness and mitigates vulnerabilities in modern aviation systems by equipping technicians with competencies in digital flight controls, navigation, communications, surveillance, and cybersecurity. Using an integrated approach, the project will deploy evidence-based programs to help close the technological skills gap and support the success of students and military-connected avionics technicians. The consortium will promote participation, persistence, and career readiness in avionics technician education, while addressing the rapid evolution of aviation technologies, fostering a globally competitive STEM workforce. Active participation from a broad stakeholder group including industry and secondary education will enhance partnerships between academia and industry.

TABLE OF CONTENTS

For font size and page formatting specifications, see PAPPG section II.B.2.

	Total No. of Pages	Page No.* (Optional)*
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Project Summary (not to exceed 1 page)	<u>1</u>	<u> </u>
Table of Contents	<u>1</u>	<u> </u>
Project Description (Including Results from Prior NSF Support) (not to exceed 15 pages) (Exceed only if allowed by a specific solicitation or if approved in advance by the appropriate cognizant NSF Assistant Director or designee)	<u>15</u>	<u> </u>
References Cited	<u>3</u>	<u> </u>
Biographical Sketches	<u>8</u>	<u> </u>
Budget (Plus up to 5 pages of budget justification. For proposals that contain subaward(s), each subaward must include a separate budget justification of no more than 5 pages)	<u>26</u>	<u> </u>
Current and Pending (Other) Support	<u>15</u>	<u> </u>
Synergistic Activities	<u>6</u>	<u> </u>
Facilities, Equipment and Other Resources	<u>5</u>	<u> </u>
Special Information/Supplementary Documents (Data Management and Sharing Plan, Mentoring Plan and Other Supplementary Documents)	<u>26</u>	<u> </u>
Appendix (List below.) (Include only if allowed by a specific program announcement/solicitation or if approved in advance by the appropriate NSF Assistant Director or designee)	<u> </u>	<u> </u>
Appendix Items:		

*Proposers may select any numbering mechanism for the proposal. The entire proposal however, must be paginated. Complete both columns only if the proposal is numbered consecutively.

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Project Description (Including Results from Prior NSF Support) (not to exceed 15 pages) (Exceed only if allowed by a specific solicitation or if approved in advance by the appropriate cognizant NSF Assistant Director or designee)	_____	_____
References Cited	_____	_____
Biographical Sketches	10	_____
Budget (Plus up to 5 pages of budget justification. For proposals that contain subaward(s), each subaward must include a separate budget justification of no more than 5 pages)	7	_____
	40	_____
Current and Pending (Other) Support	4	_____
Synergistic Activities	4	_____
Facilities, Equipment and Other Resources	1	_____
Special Information/Supplementary Documents (Data Management and Sharing Plan, Mentoring Plan and Other Supplementary Documents)	_____	_____
Appendix (List below.) (Include only if allowed by a specific program announcement/solicitation or if approved in advance by the appropriate NSF Assistant Director or designee)	_____	_____
Appendix Items:		

*Proposers may select any numbering mechanism for the proposal. The entire proposal however, must be paginated. Complete both columns only if the proposal is numbered consecutively.

Project Description

A. Results from Prior NSF Support

Wichita State University Campus of Applied Sciences and Technology (WSU Tech) will be the lead institution on this ATE project. The PI and institutional Co-PIs do not have previous NSF awards. However, the college has a history of NSF awards as recipient on a collaborative project. The collaborating institution, Clemson University (CU)'s NSF prior support includes the following awards with direct relevance to the proposed project:

Award #2326185: [REDACTED] (10/01/2023–09/30/2027). *FW-HTF-RL/Collaborative Research: The Future of Aviation Inspection: Artificial Intelligence and Mixed Reality as Agents of Transformation.* **Chalil Madathil [Co-PI]. Intellectual Merit:** The project is advancing understanding of how artificial intelligence (AI) and extended reality (XR) can augment aviation maintenance technicians during inspection tasks. The team designed AI models to support aircraft inspections, developed XR-enabled inspection environments, and studied how these tools affect technician cognition, workload, and trust. **Broader Impacts:** The work improved knowledge of human–technology teaming in safety-critical aviation domains, with implications for reducing maintenance errors and aviation accidents. It engaged industry partners, technical colleges, and professional organizations to ensure findings were workforce relevant. **Products:** AI-enabled inspection prototypes; XR simulation testbeds; and evaluation data on technician workload, trust, and performance. **Publications:** [1-6]

Award #2033801: [REDACTED] (08/01/2020–07/31/2026). *The Center for Aviation and Automotive Technology Education using E-Learning: Providing E-Learning Resources and Increasing Knowledge About Their Effectiveness.* **Chalil Madathil [Co-PI]. Intellectual Merit:** This project is conducting evidence-based research and longitudinal studies on the efficacy of e-learning and VR/AR in technician education, advancing understanding of how immersive technologies improve skill acquisition and workforce readiness. **Broader Impacts:** More than 3,000 students in the aviation and automotive technician domains have used the project's digital learning tools, improving accessibility and training outcomes. **Products:** The project produced 85 digital learning tools, including VR simulations and instructor guides, which are available to educators through EducateWorkforce and CA²VES platforms. **Publications:** [1-3].

Subrecipient partners Aims Community College and Calhoun Community College and their respective institutional Co-PIs do not have relevant NSF prior support.

B. Introduction

Avionics, defined as the integration of advanced electronic systems for navigation, communication, surveillance, flight control, and safety, represents a rapidly growing and strategically vital sector of aviation. The avionics technician workforce underpins national security, economic competitiveness, and the continued safety of the U.S. air transportation system and defense. With avionics technician employment projected to grow by 11% over the next two decades [1], [2], and nearly half of the current workforce expected to retire within the next decade [3-8], the need for a robust pipeline of highly skilled avionics professionals is urgent. **Wichita State University Campus of Applied Sciences and Technology (WSU Tech)**, a nationally recognized aviation technical college in Wichita, Kansas, together with **Aims Community College (ACC)** in Greeley, Colorado, **Calhoun Community College (CCC)** in Decatur, Alabama, Clemson University's **NSF ATE Center for Aviation and Automotive Technological Education Using Virtual E-Schools (CA²VES)** in South Carolina, industry partners and secondary education stakeholders proposes: Collaborative Research: AVIATE (Advancing AVionics in American Technical Education), A National ATE Consortium. Through AVIATE, the consortium will create and integrate evidence-based curricula, deploy immersive learning technologies, align programs with industry-defined competencies, and implement avionics content across participating institutions. AVIATE will strengthen avionics career pathways, expand training capacity, and ensure the U.S. maintains global leadership in aviation safety, innovation, defense readiness, and workforce development.

Figure 1: Strengthening America's avionics workforce with evidence-based education pathways



C. The Case for Strengthening Avionics Technician Education to Advance U.S. Competitiveness

Motivating Rationale: The aviation and aerospace industry will grow rapidly over the next two decades, according to projections from Boeing, the Federal Aviation Administration, and the Bureau of Labor Statistics [1], [2]. Boeing forecasts that overall job growth for aircraft maintenance and service technicians will reach 17% over this period, with general aircraft maintenance technicians increasing by 6% and avionics technicians by 11%—a faster rate of growth tied directly to the specialized skillset required for avionics work [4]. Demographic pressures will compound this demand: nearly half of the existing technician workforce is expected to retire or approach retirement within the next decade, while the pipeline of graduating students is insufficient to meet replacement needs [5-8].

While the aviation sector continues to retire older aircraft and extend maintenance intervals through improvements in design, automation, and computerization, these efficiencies will not offset the overall demand for highly trained technicians. Instead, the combination of global aviation growth, technological change, and an aging workforce is expected to result in a significant shortage of aviation technicians in the United States [8]. Within this broader workforce demand, avionics maintenance has emerged as one of the most critical areas. The rapid integration of advanced navigation, communication, surveillance, cybersecurity, and digital flight control systems into both legacy and next-generation aircraft has elevated the role of avionics technicians to the forefront of aviation safety and operational readiness. Avionics technicians are responsible for maintaining flight instrumentation, electrical power systems, autopilot systems, sensors, and integrated data networks. Their work requires not only mechanical proficiency but also advanced competencies in electronics, digital troubleshooting, automation, and systems integration.

The importance of this workforce cannot be overstated. The U.S. aviation system is among the safest in the world, and sustaining this record requires a pipeline of highly qualified, certified personnel who can meet the highest standards of competence and reliability [9], [10]. As aviation technologies evolve, fleet maintenance increasingly demands technicians with advanced operational knowledge. Modern aircraft now function as highly integrated digital platforms, with computer systems and avionics subsystems that are both sophisticated and complex [11]. These converging pressures of industry growth, technological change, and workforce refinements highlight the urgent need for coordinated action to strengthen the avionics technician pipeline. To address this national workforce challenge, WSU Tech, Aims Community College, Calhoun Community College, and the NSF ATE Center for Aviation and Automotive Technological Education Using Virtual E-Schools (CA²VES) at Clemson University, will form the AVIATE consortium to build a multi-regional ecosystem for avionics technical education.

WSU Tech, the lead institution, is in Wichita, Kansas and serves over 6,000 students per year. WSU Tech offers Associate of Applied Science degrees and technical certificates in Aviation Maintenance Technology

and Avionics Technology, supported by faculty with extensive industry experience at Boeing, Textron Aviation, Bombardier, Spirit AeroSystems, and other major aerospace companies. **Aims Community College**, serving more than 7,500 students across four campuses, emphasizes accessibility and FAA-aligned training through multiple aviation pathways. Its new Aircraft Maintenance Training Center at Northern Colorado Regional Airport expands regional STEM and workforce pipelines. **Calhoun Community College**, the largest two-year institution in Alabama, serves over 9,000 students annually and is a leader in advanced manufacturing and aerospace. Its programs in aerospace technology, welding, and non-destructive testing, along with a new Avionics degree, prepare students for aerospace and defense careers in a region with rapid workforce growth. **CA²VES**, an NSF ATE center at Clemson University in South Carolina extends the consortium's reach through its expertise in building evidence-based digital learning tools. CA²VES has provided digital and hybrid education to more than 25,000 students and offers expertise in creating, curating, and scaling e-learning, XR-enabled content, and hybrid curricula.

The Aviation Technician Education Council (ATEC), a national nonprofit representing FAA-certificated aviation maintenance technician schools, employers, and stakeholders, provides leadership in aligning education with workforce needs. **Choose Aerospace**, a nonprofit initiative led by ATEC, develops turnkey, high school-based aviation maintenance curricula to expand and diversify the talent pipeline. Together, ATEC and Choose Aerospace will play a key role in this project by connecting industry and education stakeholders, advancing evidence-based curricula, and ensuring national adoption of avionics content across secondary and postsecondary programs. **Aviation Electronics Association (AEA)** *owns the Certified Aircraft Electronics Technician (CAET) credential, the industry-recognized certification that validates avionics technician competency, ensuring the developed curriculum creates a direct pathway to professional credentialing.*

Industry partners, including original equipment manufacturers; maintenance, repair, and overhaul organizations; and airlines bring deep expertise in avionics and workforce needs. They will play a key role in this project by validating competencies, advising on curriculum development, providing experiential learning opportunities, and supporting the national adoption of evidence-based avionics education. Informed by stakeholder input, AVIATE will expand training capacity, strengthen technician pipelines, and support U.S. leadership in aviation safety, innovation, and workforce readiness.

PRELIMINARY WORK AND FOUNDATIONAL EFFORTS: The AVIATE consortium builds on prior work conducted through a NASA-funded project, which identified gaps in the FAA Airman Certification Standards [12] and emerging workforce needs for advanced technology aircraft. This effort, guided by national workshops and industry input, highlighted critical competencies missing in current aviation maintenance technician training, particularly in areas such as computer networks, systems integration, and cybersecurity [13], [14]. It also identified required competencies in electrical theory, digital troubleshooting, systems integration, and regulatory compliance; skills such as fault isolation, wiring inspection, diagnostic software use, and high-voltage safety; and abilities including critical thinking, adaptability, communication, and precision in safety-critical tasks. While this preliminary work identified basic avionics competencies, the competencies require deeper examination to ensure alignment with the increasingly complex digital, automated, and integrated systems found in modern aircraft. These findings provide a strong foundation for AVIATE to develop and scale industry-aligned avionics technician education across partner institutions. The AVIATE consortium will address workforce needs and improve student learning in avionics technician education and training. The goals are ambitious, attainable, and aligned with both current and future requirements of the avionics maintenance and service industry for two-year college students and incumbent workers. The detailed goals, objectives, activities, outcomes, timeline, and responsibilities are presented in Table 1.

Goal 1. Identify Current and Emerging Workforce Requirements for Avionics Technicians. The consortium will collaborate with industry partners to refine and validate the knowledge, skills, and abilities required of avionics technicians to support advanced technology aircraft. This includes digital flight controls, navigation, communication, surveillance, and cybersecurity systems. Through workshops, surveys, and advisory input, the team will identify gaps between current avionics technician training and industry needs, ensuring alignment with evolving avionics technologies.

Goal 2. Design, Develop and Implement Innovative Avionics Curriculum. The consortium will develop new avionics learning modules in online and hybrid formats, combining classroom instruction, laboratory experiences, and extended reality (XR) simulations. These resources will be evaluated using evidence-based methods to measure learning effectiveness and workforce readiness. Finalized modules will be made available as educational resources for the aviation maintenance community.

Goal 3. Broaden and Strengthen the Avionics Technician Pipeline. Recruitment and retention strategies will expand participation in avionics programs, with a focus on two-year college students, high school students, and incumbent workers. Such strategies will emphasize veterans, rural students, and military personnel transitioning to the civilian sector. These strategies will increase access to high-quality education and strengthen the national pipeline of skilled avionics technicians.

Goal 4. Build Instructor Capacity and National Networks. Professional development opportunities will prepare instructors and faculty leaders to implement the new curricula. Workshops, mentoring, and collaborative networks will support adoption and dissemination, while also cultivating future program leaders in avionics technician education. These efforts will promote sustainability and long-term impact across the avionics education ecosystem.

INNOVATIVE AND EVIDENCE-BASED CURRICULUM IN AVIONICS: The consortium will deliver an industry-informed, scalable, ADA-compliant hybrid curriculum that integrates digital learning, XR simulations, and hands-on labs across avionics domains. Students will practice troubleshooting flight control, communication, and navigation systems in safe, simulated environments, while assessment tools provide adaptive feedback and confirm mastery before live application. This blended model of classroom instruction, experiential training, and industry apprenticeships will prepare technicians with the skills required for next-generation aircraft. Deliverables will be disseminated to colleges and high schools, archived at ATE Central, and sustained through professional development and mentoring for educators. All deliverables will be disseminated to the two-year college community and regional high school partners, archived at ATE Central, and shared with other ATE centers and projects. Professional development will be provided to secondary educators and two-year college faculty to ensure adoption, dissemination, and sustainability. Secondary educators will be mentored by college faculty during curriculum adoption to ensure classroom implementation is easily achieved. All deliverables will be disseminated to the two-year college community and regional high school partners, archived at ATE Central, and shared with other ATE centers and projects. Professional development will be provided to secondary educators and two-year college faculty to ensure adoption, dissemination, and sustainability. College faculty will mentor secondary educators during curriculum adoption to ensure classroom implementation is easily achieved.

EFFECTIVE PARTNERSHIP DEVELOPMENT: AVIATE will expand collaborations with secondary education, industry, ATE Centers, professional organizations, and academic partners to align avionics education with workforce needs. Partners bring expertise in avionics systems, XR simulation, cybersecurity, and evidence-based curriculum development, along with proven capacity to scale technical education and build pipelines from secondary to postsecondary to industry. Leveraging these strengths, the consortium will accelerate curriculum development, dissemination, and adoption, ensuring responsiveness to industry priorities and regional economic needs. The result will be a significant increase in the number of avionics technicians trained through technologically advanced, industry-informed curricula, equipped for rapid innovation and lifelong learning.

MITIGATION OF EDUCATIONAL DISRUPTIONS: The consortium will ensure continuity of avionics education through a hybrid model that integrates ADA-compliant digital learning, XR simulations, and in-person labs. This approach allows students to access training on common devices during disruptions such as pandemics or natural disasters, while maintaining critical hands-on experiences. All curriculum will be archived at ATE Central and hosted on EducateWorkforce, guaranteeing long-term access and technical accuracy. This consortium will provide flexible, resilient, and scalable training that ensures workforce development continues uninterrupted and strengthens U.S. competitiveness in all conditions.

Goals, Objectives, Deliverables, and Activities

Table 1: Goals, Objectives, Activities, Responsibilities, Outcomes, and Timeline

Responsibilities by Organizations: WSU Tech [W], NSF ATE Center CA ² VES [C], Aims Community College [ACC], Calhoun Community College [CCC], Secondary Education [SE], Industry Partners [IAC], External Evaluator [EE]			Year 1		Year 2		Year 3	
			Q 1-2	Q 3-4	Q 1-2	Q 3-4	Q 1-2	Q 3-4
Objectives	Activities & Partners Responsible [Lead/Co-Lead]	Outcomes						
Goal 1 – Needs Assessment: Identify Current and Emerging Workforce Requirements for Avionics Technicians								
Objective 1.1 Identify avionics workforce needs	1.1.1 Conduct 25 interviews with industry partners and analyze data to identify key avionics workforce needs and curricular gaps [W, C, ACC, CCC, EE]	- Comprehensive report on current and emerging workforce needs for avionics technicians - Analysis of curricular alignment with industry standards, highlighting strengths and deficiencies in existing programs. - Action plan for ongoing collaboration among consortium members, ATE Centers, and industry partners to ensure curriculum responsiveness to evolving avionics technologies. - Prioritized needs identified by consortium partners.	○					
	1.1.2 Develop and distribute 100 surveys (through ATEC) based on interview findings to validate and build consensus on skill gaps in workforce preparation [W, C, ACC, CCC, EE]		○	○				
Objective 1.2 Identify current and planned avionics curricula used by NSF ATE Center partners and other subject matter experts	1.2.1 Conduct one workshop with NSF ATE Center partners (NCAT, NCyTE, CA ² VES and RCNET) [W, C, ACC, CCC, IAC, SE]				○			
	1.2.2 Survey NSF ATE Center partners, consortium members, and SMEs to document current and planned avionics curricula [W, C, EE]		○	○				
	1.2.3 Analyze workshop and survey data to identify curricular strengths, gaps, and areas for integration [W, C, ACC, CCC, EE]				○	○		
Objective 1.3 Plan ongoing avionics curriculum collaboration	1.3.1 Facilitate quarterly discussions with partners to review curriculum needs and ensure alignment with industry needs. [W]		○	○	○	○	○	○
Goal 2 – Curriculum Development: Design, Develop and Implement Innovative Avionics Curriculum								
Objective 2.1 Define industry-based learning objectives, map modules, and develop industry-	2.1.1 Leverage consortium expertise to define learning objectives and develop a strategic implementation plan for avionics technician education. [W, C, ACC, CCC, SE]	A consortium-approved strategic implementation plan that defines adoption pathways, timelines, and		○				

aligned classroom materials and assessments.	2.1.2 Develop and validate module-level curriculum outlines based on industry driven learning objectives. [W, C, ACC, CCC]	responsibilities for avionics curriculum across partner institutions.		○	○			
	2.1.3 Create classroom instructional materials and assessments based on learning objectives to complement digital learning tools and align with FAA & industry standards. [C]	- A set of validated module outlines that translate industry-driven competencies into measurable learning objectives. - Assessment materials aligned with FAA and industry standards.		○	○	○	○	
Objective 2.2 Create hybrid instructional materials using new Digital Learning Tools (DLTs) informed by expertise from industry, IHEs, & relevant pedagogical research (see Figure 2)	2.2.1 Design and develop 50 avionics education digital learning tools (slides and videos) and associated instructional materials [C]	A library of 50 digital learning tools tailored to avionics technician education.		○	○	○	○	
	2.2.2 Design and develop 15 XR teaching simulations (e.g., avionics troubleshooting tasks, digital flight control systems, navigation/communication scenarios) using Unity3D [C]	15 XR simulations representing authentic avionics maintenance and troubleshooting scenarios. - Customizable, modular VR/AR learning packages adaptable for classroom, hybrid, and other training settings.		○	○	○	○	
	2.2.3 Customize and modularize XR and digital learning packages for flexible adoption across relevant programs [C]	Evidence-based instructional resources aligned with workforce needs and FAA standards.		○	○	○	○	
Objective 2.3 Field test modules & courses with stakeholders followed by implementation & release of modules	2.3.1 Phase 1 – α Testing: Identify and implement field test sites in Kansas Phase 2 – β Testing: Identification & implementation of field test sites in Alabama and Colorado. [W, ACC, CCC, SE, IAC]	- Testing sites established for avionics curriculum pilots. - Training modules validated, refined, and implemented. - Modules released as resources for high schools, colleges, and industry.		○	○	○	○	
	2.3.2 Iterative testing and refinement of curriculum modules with subject matter expert (SME) feedback loop [W, ACC, CCC]				○	○	○	○
Objective 2.4 Integrate digital learning tools into avionics technician programs and evaluate effectiveness.	2.4.1 Conduct focus groups, interviews, surveys, and data analysis with learners, educators, industry, and IHE partners to determine digital learning tool acceptance, use, and effectiveness. [W, C, EE]	Evidence of digital learning tool acceptance, use, and effectiveness from learners, educators, and industry partners.			○	○	○	
	2.4.2 Implement, assess, and refine courses while collecting learner and educator	Refined avionics courses that integrate digital tools and			○	○	○	○

	feedback on digital learning tool use and effectiveness. [W, C, ACC, CCC, SE]	demonstrate improved student learning outcomes.						
	2.4.3 Develop and carry out a systematic evaluation plan, including self-study and annual assessments. [W, C, EE]	▪ Annual self-study and assessment reports documenting program quality, content alignment, and effectiveness.		○		○		○
	2.4.4 Create apprenticeship opportunities with industry partners to strengthen career pathways and workforce readiness. [W, EE]	▪ Established apprenticeship pathways with industry partners that expand workforce readiness opportunities.	○	○	○	○	○	○
Goal 3 – Recruit and Disseminate: Broaden and Strengthen the Avionics Pipeline								
Objective 3.1 Develop coalitions in specialized avionics areas (digital flight control systems, communication & navigation technologies, avionics cybersecurity, and automation).	3.1.1 Hold one annual workshop at consortium colleges to review avionics resources, address local training challenges, and support adoption. [W, ACC, CCC, IAC, SE]	▪ Best practices in avionics education documented and shared across consortium partners. ▪ Curricula refined based on workshop feedback to address local and regional training needs. ▪ Increased adoption and visibility of developed avionics resources.		○		○		○
	Objective 3.2 Develop and implement two avionics program-specific recruitment campaigns and supporting materials	3.2.1 Co-create recruitment campaigns and XR-based toolkits with consortium partners. [W, ACC, CCC, IAC, SE]		○		○		○
		3.2.2 Develop a recruitment toolkit leveraging XR technologies to provide immersive exposure to avionics technician careers, tailored for use by two-year colleges and high schools. [W, ACC, CCC, IAC, SE]				○		○
		3.2.3 Deliver <u>two</u> webinars for secondary education counselors and two-year college faculty and administrators focused on effective strategies to recruit potential students into avionics programs. [W]				○		○
		3.2.4 Disseminate recruitment toolkits and digital resources to high schools and two-year college partners for direct student engagement and outreach. [W, ACC, CCC, SE]				○	○	○
	3.2.5 Recruit students and implement avionics curriculum at secondary levels.	▪ Growth in enrollment and implementation of avionics programs			○	○	○	○

	(Choose Aerospace pathway). [W, ACC, CCC, SE]	at both secondary and postsecondary levels.							
	3.2.6 Recruit students and implement avionics curriculum at the postsecondary levels. [W, C, ACC, CCC]				○	○	○	○	
Objective 3.3 Sustain and disseminate the project findings for five years online, then archive them on the ATE Central portal for long-term use.	3.3.1 Provide access to best practice findings, toolkits and reports through Creative Commons, ATE Central, EducateWorkforce, and CA ² VES Portal. [W, C]	- Sustained access to project findings, toolkits, and reports for five years. - Findings disseminated broadly through multiple open-access platforms.					○	○	
	3.3.2 Archive project resources and findings with ATE Central for permanent availability. [W, C]	Increased visibility and reuse of consortium findings by educators, researchers, and industry.						○	
Goal 4 – Faculty Training: Build Instructor Capacity and National Network									
Objective 4.1 Provide professional development (PD) for instructors on curriculum implementation	4.1.1 Develop PD resources to support integration of new curricula into existing courses and LMS platforms. [W, C]	LMS guides, instructor guides, toolkits, and assessment rubrics to support curriculum adoption.			○	○	○	○	
	4.1.2 Deliver two webinars focused on effective curriculum implementation strategies. [W]	Recorded workshops and tutorials strengthen faculty capacity to deliver XR-based avionics training.				○		○	
Objective 4.2 Establish a national avionics education network	4.2.1 Create an online community of practice to connect faculty, industry, and ATE partners. [W, C]	A platform for instructors to share practices, solve challenges, and access new materials.				○	○	○	
	4.2.2 Host an annual consortium-led meeting aligned with ATE meetings to disseminate findings and strengthen faculty-industry linkages. [W, C]	Sustained network that supports faculty, speeds adoption, and fosters long-term collaboration.		○		○		○	

E. Strategies for Course Development and Roll Out

CONTENT DEVELOPMENT AND DELIVERY: Modules will address avionics technician training as well as core academic and workplace competencies such as communication, critical thinking, teamwork, and adaptability. Information exchange among consortium members, industry, and educational partners during curriculum development will ensure adherence to FAA standards and incorporation of best practices. Modules will be designed for the unique needs of secondary education, two-year colleges, military-connected, and industry incumbent avionics technicians. CA²VES will collect and analyze usage data (including learner performance, aptitude, and ability) to inform curriculum refinement and evaluate training effectiveness. The embedded AI will predict learner performance using prior performance data to provide adaptive support. Certificates of completion will be awarded upon completion of courses or modules, providing recognition of acquired skills. Ethical and privacy issues will be addressed in accordance with the institutional review board and privacy protocols, ensuring compliance with all institutional and federal

Table 2: Example Avionics Course Modules

Modules*	Learning Objectives	Extended Reality Enabled labs
Avionics Systems Foundations	Identify avionics subsystems; describe instruments; explain system integration.	XR lab to trace subsystems and label instruments in a virtual cockpit.
Cybersecurity in Avionics	Identify cyber vulnerabilities; apply protective measures; follow FAA/ICAO cyber safety practices	XR lab simulating avionics network intrusion attempts; practice applying encryption/authentication measures in cockpit systems.
Navigation Systems and Performance	Explain operation of navigation systems; apply signals to flight scenarios; evaluate system accuracy.	XR lab to tune and interpret VOR, DME, ILS, and GPS signals; practice flight path corrections in a virtual cockpit.
Aircraft Communication & Surveillance	Describe radio theory; operate communication and surveillance equipment; troubleshoot failures.	XR lab to configure and test VHF/UHF radios and transponders; practice ADS-B setup and fault detection.
Avionics Troubleshooting and Diagnostics	Operate avionics test sets; apply diagnostic processes; record and report technical findings.	XR lab to practice structured troubleshooting and documenting corrective actions.
Human Factors and Avionics Safety	Explain human-machine interface risks; assess system-induced errors; apply CRM and safety protocols.	XR lab with cockpit HMI error simulations; practice recognizing and responding to misinterpreted signals.
*All modules will include multiple lessons, short videos, XR simulations, and assessments.		

F. Consortia Connections to ATE Centers and Projects

The PI and Co-PIs will use their broad network of relationships within avionics technician education and with existing ATE centers around the country to provide subject matter expertise for curricular modules as they are developed, to inform the project on best practices in developing sustainable secondary-postsecondary-industry avionics technician workforce pipelines, and to disseminate products and resources the AVIATE consortium develops. Collaboration with ATE Centers and projects is embedded across the project's goals, ensuring alignment with national priorities, validation of curricula, and sustained impact.

The AVIATE consortium is closely aligned with five NSF ATE Centers and two ATE projects focusing on extended reality technologies (*letters of collaboration included*). These include CA²VES project; the National Center for Autonomous Technologies (NCAT) at Northland Community and Technical College; the National Cybersecurity Training and Education Center (NCyTE); SpaceTEC Partners; and the Regional Center for Nuclear Education and Training (RCNET) at Indian River State College. Each Center will play a distinct role in shaping and scaling AVIATE deliverables.

CA²VES designs and develops state-of-the-art XR-based modules for technician education. Within AVIATE, CA²VES will lead the development of digital learning tools and XR simulations (Goal 2), provide professional development toolkits for instructors (Goal 4), and disseminate curriculum and research findings through the EducateWorkforce portal and ATE Central (Goal 3). NCAT develops a strong technical workforce by supporting and recruiting rural students into aviation and autonomous technology careers. NCAT will advise the consortium on workforce pipeline development (Goals 1 and 3), provide feedback on curriculum from its UAS CTI network, and host dissemination through ATE forums (Goal 4).

NCyTE leads national efforts in cybersecurity workforce development. NCyTE will ensure avionics curriculum modules integrate cybersecurity competencies (Goal 2), and it will extend consortium reach through its network of secondary and postsecondary partners (Goal 3). SpaceTEC provides nationally recognized credentials reflecting employer-driven competencies. SpaceTEC will provide guidance to align

curriculum modules with certification standards (Goal 2), ensuring assessment strategies support industry-validated outcomes and strengthening student employability. RCNET brings expertise in consortium-building and workforce pipeline development. RCNET will advise on sustainability strategies (Goal 1), review curriculum integration efforts (Goal 2), and disseminate educator training resources through its regional and national forums (Goal 4). RECITE will provide expertise in XR standards and instructional design to inform DLT development (Goal 2), support recruitment and retention through immersive VR learning experiences (Goal 3), and guide integration of deliverables into national XR repositories for broad dissemination (Goal 3). KonnectXR will advise on XR hardware and software deployment (Goal 2), share proven strategies for immersive avionics simulations to enhance learning (Goal 3), and support dissemination through its national educator and workforce network (Goal 4).

By aligning AVIATE's goals with the expertise of these Centers and Projects, the consortium will create an evidence-based avionics curriculum that is validated by industry, strengthened by cybersecurity and certification standards, delivered through XR-enabled resources, and sustained by a national faculty and industry network. This approach ensures that AVIATE builds upon existing NSF ATE investments and extends ATE Centers' reach to address the urgent workforce needs of the avionics technician pipeline.

G. Management Plan

The AVIATE consortium PI and CO-PIs have a strong history of joint work serving on industry-focused advisory councils and through projects such as NSF programs, building career pathway programs, and developing new aviation-related academic programs at their respective institutions. Project management and implementation will draw on this foundation of collaboration, reflecting strong faculty leadership, institutional support for the proposed activities, and active engagement from each consortium member institution.

PROJECT LEADERSHIP AND ROLES: *The Principal Investigator, Mr. James Hall*, Vice President, Aviation & Workforce Development, will direct and manage this effort. He will be responsible for strategic planning, coordination, communication with investigators and partners, and establishing a system of compliance to align with the goals and objectives outlined in this proposal. He will meet monthly with Co-PIs to discuss progress and upcoming activities, have quarterly conference calls with stakeholders, and arrange twice-yearly progress meetings for all stakeholders and evaluators. He will leverage multiple resources and partnerships to meet the goals and objectives for the benefit of the project. Mr. Hall will be responsible for the AVIATE project budget, collaborating with consortium partners and stakeholders to collect relevant data, and collaborating directly with the external evaluators to ensure the project is informed by formative and summative evaluation. Mr. Hall will submit all reports to NSF as required and facilitate dissemination of the project's activities and impact to the scientific community and public.

Co-Principal Investigators: Dr. Kapil Chalil Madathil will serve as the **Co-PI** for the collaborating institution, Clemson University. He is the Wilfred P. Tienken Endowed Professor of Industrial Engineering and the Director of the Center for Workforce Development at Clemson University. His expertise lies in applying human factors engineering to the design and operation of human-machine systems for training and education. He will be responsible for leading the development of the hybrid avionics curriculum and supporting instructional materials. **Ms. Dawn Kealey**, Assistant Dean of Aviation, and **Mr. Aaron Brenwald**, Avionics Faculty, will serve as **Co-PIs** for WSU Tech. **Mr. Michael Sasso**, Airframe & Powerplant Chief will serve as the **Co-PI** for Aims Community College. **Mr. Adam Crow**, Aviation Instructor, will serve as the **Co-PI** for Calhoun Community College. As the institutional Co-PIs, each will be responsible for employing regional postsecondary education and industry networks to inform the needs assessment for the curriculum. Institutional Co-PIs will also have primary responsibility for their institution's participation in the curriculum review, iterative testing, and full implementation of the avionics curriculum as it is developed and made available to two-year institutions. As the institutional Co-PI, each will be responsible for data collection and sharing, participating in formative and summative evaluation. Institutional Co-PIs Sasso and Crow will be responsible for managing their respective institutional subawardee budgets.

Other Senior Personnel: **Mr. Burton Schriber**, Avionics faculty at Aims Community College will serve as a subject matter expert on the AVIATE project. He will be responsible for implementing avionics curriculum at Aims Community College for and leveraging professional relationships within the college's industry networks to inform the assessment of the curriculum as it meets regional workforce demands. **Dr. Jeffrey Bertrand**, Director of Visualizations at Clemson University Center for Workforce Development, leads a team that has developed over 300 XR simulations used by more than 20,000 students nationwide and will support the project by creating new XR learning tools.

Other Personnel: WSU Tech will hire a 1.0 FTE program manager dedicated to the day-to-day implementation of AVIATE project activities. Calhoun Community College will hire a part-time lab assistant to support student learning during simulations and in-person labs. **Dr. Anand Gramopadhye**, PI of the NSF ATE CA²VES Center and Dean of Clemson University's College of Engineering, Computing and Applied Sciences, will serve as the ATE Center Advisor, bringing decades of leadership in advanced technological education and a record of scaling aviation technician educational innovations to over 200 community colleges and industry partners nationwide. His guidance, national network, and expertise in scaling, dissemination, and evaluation will ensure alignment with ATE priorities, broaden stakeholder engagement, and support the timely delivery of high-quality outcomes across geographically dispersed institutions. **Rebecca Short**, Director of Operations of CA²VES and CUCWD, has a strong administrative background in higher education operations and will direct the annual operating plan, the institutional annual budget, project execution for Clemson University, and broaden the network with introduction of new organizations and ATE Centers.

Industry and Agency Partners: Consortia members will serve as advisors, contribute to the creation of curriculum by providing feedback on the needs from the perspective of regional and national stakeholders, and disseminate the developed DLTs through their networks, conferences, and ATE forums. The entities below are experienced in supporting workforce development needs through education and re-training. To support this project, they will leverage partnerships, be educational resources, obtain feedback, and disseminate resources.

Figure 3: Industry Partners and Other Stakeholders



CENTRAL LEADERSHIP AND COORDINATED COMMUNICATION: WSU Tech will lead the project and coordinate communication. WSU Tech will establish a Microsoft SharePoint site for the AVIATE project where all project documents, data, and meeting minutes/transcripts will be housed. Named personnel at each AVIATE member institution will have access to this SharePoint site. The team has clearly defined responsibilities, support roles, and timelines for all activities (see Table 1). Dedicated project managers and coordinators will oversee implementation and will use an adaptive project management approach to maintain regular communication, coordinate deliverables, and ensure project alignment across all consortium members.

SUBJECT MATTER EXPERTISE (SME): Project leadership recognizes the importance of all AVIATE partners, their subject matter expertise, familiarity with their respective region, and their essential roles in advancing avionics technician education. Each AVIATE member institution will designate an institutional Co-PI to serve as the regional and institutional SME. Industry partners from major aerospace companies to regional service providers will contribute expertise and access to diverse avionics systems test beds, ensuring the curriculum and resources developed are relevant, high quality, and aligned with workforce needs. Additionally, the AVIATE consortium will use existing and new professional networks with other

ATE Centers, state education agencies, and industry-based associations to infuse the project with additional subject matter expertise and stakeholder perspectives.

CONSORTIUM GOVERNANCE: The AVIATE consortium will establish an advisory council comprised of representatives from regional industry and secondary education partners, as well as representatives from other ATE Centers. Overall project responsibility lies with WSU Tech as the lead institution. Overall curriculum development responsibility lies with CA²VES at Clemson University as the collaborating institution. Each PI/Co-PI will ensure project activities stay closely aligned with the strategic plan of their respective institution. Each PI/Co-PI will manage their institutional budget, contributing relevant data and stakeholder feedback to the external evaluator, and will implement the project's activities within their own institution in a timely and compliant manner. WSU Tech will manage the relationship and primary activities of the contracted external evaluator (to be determined) and contractual vendors.

GRANT MANAGEMENT AND SUBRECIPIENT MONITORING: WSU Tech will leverage its Office of Sponsored Projects to ensure broad compliance with key post-award requirements including fiscal grant management, progress monitoring, reporting, post-award amendments, audit, and closeout. WSU Tech will conduct pre-award subrecipient risk assessments and fulfill its responsibilities for subrecipient monitoring and technical assistance according to 2 CFR 200 regulations. As a collaborating institution, Clemson University will be responsible for compliant post-award grant management functions of its own NSF award but will be required to follow WSU Tech's project reporting timelines.

H. Plan for Sustainability After the NSF Funding Period

This consortium is dedicated to delivering evidence-based resources to a wide range of stakeholders within the avionics industry. Project leadership is committed to ensuring that the outcomes of this initiative will be sustained well beyond NSF funding. All content will be integrated into the respective courses in each institution. The project will leverage the collective resources of each participating institution to secure additional support and funding for long-term success. In Years 2 and 3, the project will naturally transition toward sustainability (as required by the NSF program), with multidisciplinary stakeholders actively pursuing public-private partnerships, deeper industry engagement, and other revenue sources to support ongoing curriculum innovation.

To promote broad dissemination and impact, all modules and toolkits developed under this project will be made available through platforms such as Creative Commons, EducateWorkforce.com, and the CA²VES portal. During the project period, these resources will be openly accessible to the education and research community. To ensure the resources remain technically updated and pedagogically current after the conclusion of NSF funding, a nominal hosting fee will be introduced for for-profit and non-academic institutions. This approach balances openness with long-term sustainability, ensuring that materials continue to benefit learners nationwide. In addition, the consortium will enable the broader enterprise to offer fee-for-service contracts to avionics industry partners. These contracts will provide proprietary training tailored to specific systems, technologies, and organizational needs, thereby extending the reach and applicability of the developed resources. Membership options for non-academic institutions and industry partners will include basic licensing fees for access to evidence-based resources, XR modules, and the repository of instructional materials; integration services and evaluations, including detailed instructions for module adoption and comprehensive assessments of learning outcomes through formative and summative evaluation; and on-demand, customizable XR modules and educational materials that meet industry-specific avionics training requirements.

I. Evaluation Plan

WSU Tech will contract with a qualified external evaluator according to its competitive procurement policies. The external evaluator will be selected based on the evaluator's previous experience evaluating NSF ATE programs; experience working with technical colleges; and content expertise in curriculum design, workforce development pipelines, and to the extent possible, avionics education. Evaluation of the AVIATE project will focus on qualitative and quantitative assessments of the project's performance and progress toward achieving its stated goals. Partners will collect data using a variety of evaluation

methods including surveys, focus groups, observations, and interviews. The evaluator will analyze institutional research with standard analysis tools such as the Statistical Package for the Social Sciences (SPSS) [20]. The evaluator and project team will co-design qualitative evaluation tools; such tools may leverage standard thematic analysis tools such as MAXQDA [21]. Additionally, consortia members will be responsible for obtaining qualitative and quantitative feedback from regional stakeholders.

The project team will gather ongoing formative feedback through monthly and as-needed meetings between AVIATE project key personnel. AVIATE project stakeholders such as representatives from regional industry partners, local high schools, and advisory ATE Centers will be invited to participate in formative feedback sessions with the external evaluator and project investigators on a quarterly basis. The PI will share interim evaluation findings on a quarterly basis to aid in ongoing quality improvement efforts. The external evaluator will deliver formative evaluation reports to the project team on an annual basis. The evaluator will conduct a process assessment to determine the efficacy of the project activity plan and will provide suggestions for continuous quality improvement. Finally, the external evaluator will deliver a summative report at the end of the grant period, providing an overall assessment of the impact of the AVIATE project on regional and national avionics technician education and workforce development, and its contributions to the identified broader impacts. The evaluation questions and related data sources are outlined in Table 3. Project results will advance ATE knowledge.

Table 3: Evaluation Questions and Data Sources

Goals/Objectives	Evaluation Questions	Data Collection Tools and Timing
Goal 1: Needs Assessment: Identify current and emerging education and workforce requirements driven by the rapid integration of advanced avionics systems, including digital flight controls, navigation, communication, and surveillance technologies into modern aircraft.		
Identification of education and workforce needs	1.1 What gaps exist between current avionics workforce needs and existing (or planned) avionics curricula?	1.1 PI, industry, and secondary education interviews (Y1-Y3)
Goal 2: Curriculum: Develop and assess an innovative, cross-disciplinary, hybrid curriculum and supporting resources with integrated XR simulations and experiential learning components to be used by the aviation maintenance community.		
Avionics curricula development and assessment	2.1 To what extent is the avionics curriculum aligned with current and future workforce needs in the aviation maintenance and avionics field? 2.2 To what extent does the avionics curriculum increase students' intentions to pursue avionics careers, interest in upskilling, and enrollment/retention in foundational courses? 2.3 To what extent are students satisfied with the avionics curriculum and hybrid delivery platform?	2.1 Focus groups with industry, secondary education, and IHE partners Observation and Survey (Y2-Y3) 2.2 Student Curriculum Survey; Institutional Research Data (Y2-Y3)
Goal 3: Recruit and Disseminate: Develop and strengthen partnerships with consortium members, ATE projects and centers, industry, and secondary education to leverage expertise and share best practices for maximum impact and sustainability across avionics education.		
Avionics curricula dissemination and coalition development (via workshops, webinars, and industry discussions).	3.1 To what extent does the avionics curriculum reach the community college (CC) aviation technician community? To what extent do CC faculty plan to implement the curriculum? 3.2 To what extent do workshops, webinars, and industry discussions foster partnerships among consortium members, ATE projects and centers, and industry?	3.1 EducateWorkforce Analytics (Y2-Y3) 3.2 Coalition Building Events Follow-up Survey (Y2-Y3), Social Network Analysis Results

Goal 4: Faculty Training and National Network: Train and mentor secondary and post-secondary educators in the newly developed hybrid avionics curriculum to ensure content expertise and widespread adoption of the curriculum.		
Curricular professional development	4.1 To what extent does curriculum-focused PD increase faculty confidence and content expertise and influence their plans to implement avionics curricula?	4.1 Curriculum Implementation PD Survey (Y2-Y3)
Community of Practice	4.2 To what extent does the online community of practice strengthen faculty collaboration, resource sharing, and integration of avionics curricula?	4.2 Community of Practice Participation Survey & Analytics (Y1-Y3)

J. Broader Impacts

The AVIATE consortium will address the urgent national need for highly skilled avionics technicians by delivering a coordinated, evidence-based education strategy. Through the development of digital learning modules, immersive XR simulations, and AI-enabled assessment tools, AVIATE will modernize avionics technician education and ensure alignment with industry and FAA standards. By embedding these resources into secondary and two-year college programs, the project will strengthen STEM education and faculty development, expand public engagement through recruitment campaigns, and enhance societal well-being by preparing a workforce capable of maintaining safety-critical avionics systems essential for aviation safety and reliability. Partnerships with national ATE Centers, ATEC, and industry will ensure rapid dissemination, while professional development webinars, workshops, and coalitions will build faculty capacity and establish a national network for avionics education.

AVIATE directly supports U.S. national security, economic competitiveness, and infrastructure for research and education. The project strengthens defense readiness and mitigates vulnerabilities in modern aviation systems by equipping technicians with competencies in digital flight controls, navigation, communications, surveillance, and cybersecurity. Apprenticeships and work-based learning will accelerate career entry, increase enrollment across partner colleges, and shorten industry onboarding, directly contributing to national workforce capacity. All deliverables, including digital learning modules, instructional materials, recruitment toolkits, and evaluation data, will be disseminated through EducateWorkforce and ATE Central to ensure broad access and sustainability well beyond the funding period. AVIATE will leave a robust infrastructure of tools, partnerships, and adoption pathways that support aviation safety, national competitiveness, and the long-term advancement of avionics education.

K. Dissemination Plan

WSU Tech will be the primary coordinator of the dissemination of AVIATE project activities. The dissemination plan will maximize the impact of this project by using print, electronic, and social media to reach the widest possible audience. Online curricula, avionics modules, instructional templates, and research findings will be disseminated through EducateWorkforce.com, ATE Central, and TeachingTechnicians.org. Additional outreach will occur through industry and academic partnerships, peer-reviewed publications, professional presentations, and targeted outreach events. Deliverables from the consortium's avionics curriculum development efforts will be shared through national organizations including the Aviation Technician Education Council, ATE Centers and projects, National Council on Workforce Education, American Society of Engineering Education (ASEE), and other relevant associations. Results will be disseminated broadly to the advanced technology education community through journals such as the ATEC Journal, SAE International Journal of Aerospace, IEEE Transactions on Learning Technologies, and the Journal of Aviation/Aerospace Education & Research. Findings will also be presented at leading conferences, including AACC, ASEE, ATEC Annual Conference, SAE AeroTech, HFES, and other professional association meetings. Digital dissemination will include newsletters, webinars, and workshops delivered through EducateWorkforce.com and partner platforms.

Use of Generative AI in Proposal Preparation

Generative artificial intelligence (AI) tools were used selectively and under direct human supervision to support drafting, formatting, and alignment with NSF guidance [22].

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Facilities, Equipment, and Other Resources WSU Tech and Subrecipient Partners

Campus Space and Facilities

WSU Tech

Wichita State University Campus of Applied Sciences and Technology (WSU Tech) in Wichita, Kansas has five locations throughout the city. WSU Tech's aviation programs are at the main campus, which is also the National Center for Aviation Training (NCAT). The NCAT facility comprises 220,000 square feet of premier training labs and classrooms at the regional Colonel James Jabara airport in northeast Wichita, a regional airport owned by the Wichita Airport Authority.

Three buildings make up the NCAT campus: the gateway building (Building 100), the manufacturing building (M Wing, Building 200), and the aviation maintenance building (S Wing, Building 300). There are four designated computer labs within the NCAT buildings. The building also includes dedicated avionics technician classroom and lab space, which AVIATE project students will use extensively.

The gateway building (Building 100) is primarily for student services and administration. The gateway building houses the president, several members of the executive leadership team, marketing, NCAT student services (advising, financial aid, registrar, career services), institutional research, security, and finance.

S Wing, Building 300, houses a 20,000-square-foot hangar, labs for avionics, power plant, airframe, materials testing, fiberoptics, mechanical, and additional space for welding, machining, and an inspection hot lab. There is a 904-foot ramp with 23 tie-down locations adjacent to Building 300. A current construction project includes a new 120,000-foot hangar with a new ramp to the south of the existing ramp. The new ramp is complete, with a land lease for this new ramp effective May 2025. Once the rest of the construction is completed on the new hangar (expected completion of the hangar will occur in time to accommodate student enrollment for the fall 2026 semester), this facility will significantly expand enrollment in WSU Tech's avionics technician, professional pilot, airframe, and mechanic student capacities. The facility will also include a smart manufacturing facility and an additional 35,000 square feet of classrooms and labs to accommodate future programming.

Each of the three buildings on the NCAT campus has four designated administration offices and a collaborative space for instructors. Each building has approximately 25 cubicles, with an open-concept layout to encourage and facilitate collaboration. The aviation administration office has 4,200 square feet of office space at the Main Campus-NCAT. The PI and Co-PIs will use their assigned general office computers to support data analysis and communicate with students and partners on project-related information.

The above-mentioned facilities support WSU Tech's 14 programs and 50+ degree and certificate options that prepare individuals for careers in aerostructures, avionics, composites, pilot, or as maintenance technicians.

Aims Community College

The facilities and training environment of the Aims Community College Aviation Maintenance Technician School (AMTS) provide students with safe, effective, and fully compliant spaces in which to develop the required knowledge, skills, and competencies outlined in 14 CFR Part 147. The AMTS operates in dedicated classrooms, laboratories, and shop areas specifically outfitted for aviation maintenance instruction.

Classrooms have audiovisual instructional technology, computer access, and reference materials to support lecture-based learning. Laboratory spaces let students practice and refine technical skills under the direct supervision of qualified instructors. Shop areas and hangar facilities contain aircraft, engines, and training aids that allow for hands-on application of maintenance procedures in a realistic environment.

The AMTS maintains specialized areas including an avionics lab, a powerplant shop, and an airframe workshop. Each of these facilities is equipped with FAA-approved training aids, tools, and equipment required for competency-based instruction. Technical staff are responsible for maintaining these spaces in safe and serviceable condition, while instructors ensure that students use tools and equipment in accordance with established procedures.

The combination of classrooms, labs, shops, and hangar areas supports the AMTS mission of competency-based training. Facilities are structured to ensure every student has the opportunity to demonstrate required competencies in a controlled, safe, and effective environment.

Calhoun Community College

Calhoun Community College operates two campuses, Decatur and Huntsville, offering extensive instructional resources that support technical education in aerospace and related fields. Facilities include general classrooms, computer labs, specialized training centers, and hands-on workspaces.

The Advanced Technologies Center at Calhoun Community College on the Decatur campus has 56,000 square feet of state-of-the-art training space, including labs for electronics, electrical systems, and simulation-based instruction. All facilities are ADA compliant and internet enabled. Dedicated meeting rooms and office space are available for project faculty, staff, and partner coordination.

Specialized labs supporting this project include those used in Aerospace Manufacturing Technology, Mechatronics, Automotive and Diesel Technology, and the FAA Part 147 Aviation Maintenance Technology program. These labs are directly relevant to avionics training through equipment and instructional setups focused on aircraft systems, electronic troubleshooting, and precision manufacturing.

Major Equipment

WSU Tech

WSU Tech will provide all required aviation technician program-specific equipment (not charged to the grant). The NCAT's facilities, equipment, and resources available to students, faculty, and key stakeholders demonstrate WSU Tech's commitment to preparing avionics technicians to meet workforce demand.

The Avionics-Electronics program has access to the following equipment: a Databus Analyzer, an AVX-10K flight line test set, a Barfield Airdata Test Set with adapters, a DPS-450, an IFR 3500 Handheld 1GZ Radio Test set, an AFR 4000/NAV-Com/110V, an IFR 6000 SPDR/A/C/SDME test cert kit, and an XPDR/DME/TCAS/ADS-B-TIS/TIS-B Test set with upgrade.

The Pilot program utilizes the following equipment: Six Cessna 172S (N49RH 2023, N647TH 2021, N1260K 2023, N1270K 2023, N406EP 2014, N705U 2021, and Piper PA 44 Seminole N267AA 2019).

The Unmanned Aircraft Systems (UAS) program includes three Skydio X10s, two DJI Mavic 3Ts, one DJI Mavic 3M, one DJI Mavic 3, seven Phantom 4 Pro V2.0s, three DJI FPVs, one DJI Mini 2, one Matrice 300 with P1, L1, and FLIR TZ20-Vue payloads, a 2022 Chevrolet Silverado 2500, a 2022 28 ft x 8.5 ft enclosed trailer, one HP Omen field laptop, and seventeen high-performance desktop PCs.

The AMT program has access to the following equipment: Cessna 1981 172 RG, Cessna 1981 N93116 aircraft, 28 Volt Aircraft Electric System, cabinets of various sizes (36Wx36Hx24D Stat Cab Ryl Blue, 36WX36HX24D STAT RYL BLUE 6 DRWERA, 45 in. Bulk Stat Cab Ryl Blue, 54X36, ROYAL BLUE, 54Wx36Hx29D Stat Cab Ryl Blue, (2) 72 in. Bulk Stat Cab Royal Blue, a Gen 2 elock rolling cabinet, a 7-drawer Snap-On Blue Tool Chest, and a 7-drawer tool chest); an air conditioner trainer, an aircraft starter generator, an AL45 turbine hydraulic landing system, an anti-skid brake demo, (2) auto-pilot trainers (AV12 and AV23), an autocrib tambour touch tool room, an Avotech 28 volt electrical trainer, an Avotech turbocharged TCM fuel injection system, an Avotech/bender fuel injection system trainer, an Avotech/carburetor fuel system trainer, an Avotech/TCM fuel injection trainer, a constant speed drive trainer, a continental fuel injection display, a continental IO-470 teardown engine, a O-470 continental teardown engine , a digital pitot static test set, a digital static pitot test kit, an E45 PT6A Turbo-prol T/D engine, an E61 EICAS O-320 Test Cell, an electrical trainer for lights, an engine, a gas turbine engine, a fiber laser cutting machine, a fire detection and extinguishing system display, a flightcom user wireless system, a fume containment room, a gas turbine, a Global ATS Training Simulator, a heating and air trainer, a helicopter stand with stairs, a THIS certification kit, a hydraulic system trainer with motor, an industrial borescope, a Jacobs 755 engine-cutaways, a JT15D R&R trainer, a landing gear free fall demo, a landing gear and warning trailer, a McCauley & Harzel propeller, an NC3 Sheetmetal assembly certification kit, 7 planes (N25918 (1977r), N67647 1978, Unregistered 1979, N68184 1979 52, N4726L 1980, N23868 2006 172, P172D 1962], a position and warning landing trainer, a Pratt & Whitney runnable turbofan E66, a Pratt & Whitney PT6 Turbo—prop runup stand, a Precision Electric term certification kit, a PT6-34 T/D engine, a PT6A Turbine engine R&R system E47, a Skyhawk 1725, a structural sheet metal repair certification kit, a test bench (alternator/generator), a torque certification kit (TTC4500-Upgrade stand), a Tronair Aircraft Mule, a Turbo-prob T/D engine-nonrunnable E45, and a Viper II/Aces Lasetach 2.

Aims Community College

The Electrical, Electronics, and Avionics Labs at Aims Community College include three labs consisting of various workstations, along with diagnostic and testing equipment to support avionics systems training. Specific equipment includes: 1 Beechcraft Baron 55 Aircraft with Full Glass Cockpit Garmin Installation; 1 Cessna Citation 550 Aircraft with full Garmin 650 avionics package installed; 1 Beechcraft Bonanza with Partial Avionics package installed; 12 Training Workstations w/ computers to be used with the Airbus ACT for Academy software; 12 ADF Electrical / Electronic Bench Trainers plus an additional Instructor training stations; 8 Electrical Wiring Benches with Soldering Stations; 1 ADF Electrical Wiring Trainer; 1 ADF Dual Electrical System Trainer; 1 ADF Airbus MCDU Trainer; 1 ADF Aircraft Lighting Trainer; 1 ADF Pitot-Static Training System w/ Pitot Static Test Set; 1 Snap-On / NC3 Multimeter Certification Toolbox with multimeters; 1 Snap-On / NC3 Electrical Systems Certification Toolbox w/ electrical circuit trainers; 1 Laversab ARTS-700 Full Avionics Test Set; and 1 Laversab Pitot Static Test Set.

Calhoun Community College

Calhoun Community College maintains a wide range of instructional equipment relevant to avionics and aerospace education. This includes robotics trainers, CNC machining tools (HAAS Certified), simulation software, diagnostic equipment, programmable logic controllers (PLCs), and electronic control modules. Equipment is maintained under institutional safety policies, with established procedures for storage, access, and maintenance.

Other Resources

WSU Tech

WSU Tech will provide support services to interact and communicate with external partners, including business and industry, during this project's award period. Support offices will include career services, Shocker Career Accelerator, and workforce development.

WSU Tech administrative services will also interact and communicate with data sources, analysis, and relevant practices as part of this project. Departments providing administrative support include institutional effectiveness, instructional support, and academic support.

WSU Tech's Office of Sponsored Projects will also support this project. Led by the director of grants management and the director, fiscal grant management & foundation accounting, this office monitors and manages all sponsored programs for the institution. WSU Tech uses Banner ERP to accurately track, reconcile, and report on funding by award; across budget periods and fiscal years; and under governmental accounting standards in combination with CFR guidance.

WSU Tech uses Banner to manage enrollment, credentialing, and student tracking. Instruction is supported by the Canvas Learning Management System, with instructional design and ADA compliance services available. Institutional research staff provide student outcome data, evaluation support, and disaggregated reporting. IT infrastructure includes high-speed internet, secure cloud storage, and cybersecurity safeguards to protect student and institutional data.

Aims Community College

Access to additional ACC support services including the Aims2UNC Transition program, advising, career services, student accessibility services, counseling, and tutoring are available to all students, including those taking avionics technician courses.

This project will also be supported by Aims' fiscal grant manager who monitors and manages all sponsored programs for the institution. Aims Community College uses Workday Software to track, reconcile, and report on funding by award; across budget periods and fiscal years; and under governmental accounting standards in combination with CFR guidance.

Calhoun Community College

Calhoun faculty member and Co-PI Mr. Adam Crow from the Technology Division will lead the project for Calhoun. Mr. Crow brings expertise in aviation instruction, aviation maintenance, and multi-skilled maintenance. Dean John Holley, Calhoun's Dean of Technologies, will ensure academic alignment with institutional priorities and curriculum approval processes as part of his regular responsibilities. Administrative support will be provided by Calhoun's grants management office, finance team, and program coordinators. Operational support will include procurement, scheduling, and coordination with employer and community partners.

Students have access to a wide range of support services, including academic advising and the STAR Institute, which serves as the college's student support services hub and includes emergency funding. The college also has a dedicated department for disability services, which includes mental health counseling. Additional life supports include a food pantry. The Career Services Department offers résumé support, job readiness workshops, employer connections, and work-based learning opportunities. Mentorship programs and peer coaching are also available to enhance student success and retention.

Calhoun uses Banner ERP to manage enrollment, credentialing, and student tracking. Instruction is supported by the Canvas Learning Management System, with instructional design and ADA compliance services available. Institutional research staff provide student outcome data, evaluation support, and disaggregated reporting. IT infrastructure includes high-speed internet, secure cloud storage, and cybersecurity safeguards to protect student and institutional data.

The College's investment in FAA-certified aviation maintenance and aerospace education ensures continued relevance and institutional support for the avionics technology program.

Unfunded Collaborators

WSU Tech

WSU Tech's avionics technician program is infused with industry expertise from employers such as Textron Aviation, Beechcraft, Bombardier, Mid-Continent Instruments, Garmin, Honeywell, and other top aerospace companies located in Wichita, Kansas. Additionally, WSU Tech maintains strong partnerships with local and regional PK-12 educational institutions, regional advisory boards, and workforce development organizations. These partnerships support curriculum alignment to workforce needs, earn-and-learn opportunities through the college's Career Services department, and long-term sustainability of available aviation programs.

Aims Community College

External relations are also an important responsibility for the Aircraft Maintenance Chief. Aims CC AMTS maintains partnerships with industry stakeholders, employers, and community organizations to align training with workforce needs. These external relationships strengthen graduate employment opportunities and enhance the reputation of Aims Community College as a leader in aviation education.

Industry relationships include employers such as Frontier Airlines, United Airlines, Southwest Airlines, and Breeze Airways, all of which operate flights into and out of Denver International Airport. Additionally, Aims CC has a strong relationship with the local military branches, USAF in Colorado Springs and the US Army National Guard based in Cheyenne, WY, just north of its campus locations in Loveland, CO.

In current collaboration with Westminster Public Schools, Aims CC is forming a new Choose Aerospace program as bridge for high school students in the Denver area into the AMTS.

Calhoun Community College

Calhoun partners with a range of employers and industry stakeholders, including aerospace manufacturers, regional advisory boards, K12 technical centers, and workforce development organizations. These partnerships support curriculum alignment, work-based learning opportunities through the Career Services Department, and long-term sustainability of the avionics program. Dual-enrollment partnerships with high schools and homeschool groups further expand access and engagement.

This organization chart represents the breadth of academic and industry collaborations included in the AVIATE project.



FACILITIES, EQUIPMENT, AND OTHER RESOURCES

CLEMSON UNIVERSITY

ATE CENTER FOR AVIATION AND AUTOMOTIVE TECHNOLOGICAL EDUCATION USING VIRTUAL E-SCHOOLS



The NSF funded ATE Center for Aviation and Automotive Technological Education Using Virtual E-Schools, or "CA²VES," provides research-centered resources and evidence-based leadership for community colleges and the broader ATE community by designing and developing state-of-the-art virtual reality-based modules that support automotive and aviation technician education. Clemson University's Center for Workforce Development (CUCWD) houses CA²VES and is a South Carolina Commission on Higher Education approved, statewide P-20 initiative to improve workforce educational capacity in STEM fields across the state. CUCWD engages university, technical colleges, K-12 institutions, statewide industry and federal agencies to deliver workforce development tools. The mission of Clemson University Center for Workforce Development is to support demand-driven education, research, dissemination and outreach that will advance economic development and enhance employment opportunities for South Carolinians thereby providing industry with a highly qualified talent pool of next generation technicians, engineers and scientists.

The primary target for CUCWD E-learning is two-year technical and community college faculty and their students in associate degree, A2 technician education programs. Working through partners within the South Carolina technical college system, CUCWD also uses the virtual teaching environment to encourage and assist high school students in choosing careers as either aviation or automotive professionals. The CUCWD initiative is innovative in that it specifically targets the young and more technology-oriented, which is the ideal point for building the foundation for a rewarding career.

Site Focused on Technician Education on EducateWorkforce.com



EducateWorkforce

In Spring 2014, CUCWD, in partnership with the NSF ATE CA²VES, launched the EducateWorkforce site, the first ever online course training site for delivering technician education to both industry and educational institutions. This site brings new perspectives and opportunities for an authentic workplace experience compared to traditional technological education. Courses are tailored to the unique needs of two-year colleges and technicians. This site offers partnering technical colleges a successful blend of powerful online and digital solutions into their existing courses.

CA²VES supports education, research, dissemination and outreach activities to develop the next generation of technicians, engineers, and scientists through extensive experience in e-learning research and application developed primarily through funding from the National Science Foundation (NSF) Advanced Technological Education (ATE) program. CUCWD personnel have extensive expertise in the areas of advanced manufacturing, industrial technology, virtual reality, simulation, human/machine systems design, computer-supported collaboration, asynchronous learning technologies and curriculum assessment. Partnering with both industry and two-year educational institution sectors, the Center has developed an online technological curriculum that embodies the Universal Design for Learning (UDL) standards. These regulations help to emphasize the creation of instructional materials and assessments that appeal to all students, including those with multiple learning styles and disabilities. In an effort to extend a distance learning opportunity for this technological training provided, the EducateWorkforce site has been deployed using the MIT- Harvard Open edX platform for its openness to the community, ability to extend code and available support.

In August 2021, the Clemson University Center for Workforce Development (CUCWD) with our aerospace partners, and a committee of industry advisors disseminated its career exploration curriculum to 140 students in nine secondary, post-secondary, and community-based settings across the U.S. In addition to

expanding career awareness and broadening the workforce pipeline, the pilot test highlighted two additional areas of opportunity. The curriculum meets a growing need—instigated by pandemic-induced disruptions to our education system—for adaptive hybrid approaches to education. It also provides a venue to better reach geographically dispersed communities and expand opportunities in advanced manufacturing.

The team has access to a comprehensive range of equipment at various labs within the university and through our two year college and industry partners to train students on battery manufacturing and recycling. For battery technology and components, available equipment includes simulators, cell teardown kits, microscopes, material characterization tools, and electrochemical workstations. Electrode preparation is supported by slurry mixers, coating machines and drying ovens. Cell assembly is facilitated through glove boxes and electrolyte filling systems. Formation, encapsulation, and quality control processes utilize battery cyclers, vacuum sealers, ultrasonic welders, thickness gauges, optical inspection machines, particle counters, and environmental chambers. Safety and recycling training equipment includes crush testers, penetration testers, short-circuit testers, fire suppression systems, disassembly tools, pyrolysis and hydrometallurgical recycling equipment, and electrolyte recovery systems. For impedance spectroscopy, aging, and abuse testing, the labs offer electrochemical impedance spectroscopy systems, potentiostats/galvanostats with EIS capabilities, high-precision battery cyclers, thermal runaway simulation devices, and vibration and mechanical shock testers. This extensive range of equipment ensures hands-on learning across the battery lifecycle with a strong emphasis on safety, quality control, and real-world applications.

OTHER RESOURCES AVAILABLE TO THE PROJECT TEAM

- **Clemson University International Center for Automotive Research (CU-ICAR)**
This is an advanced-technology research campus located in Greenville, South Carolina where university, industry and government organizations engage in synergistic collaboration. With more than \$200 million in commitments, CU-ICAR directly fuels a knowledge base critical to the automotive industry. CU-ICAR also includes the the Center for Emerging Technologies, a public-private partnership that provides office space for start-up businesses and research space.
- **Clemson Vehicle Assembly Center**
The center is a four-station assembly line and module subassembly area developed in collaboration with key partners, including BMW and Siemens Automation. It is housed in the Greenville Technical College Center for Manufacturing Innovation. The Vehicle Assembly Center acts as a realistic testbed for advanced technologies in the automotive assembly process.
- **Advanced Technology Systems Laboratory (ATSL) at Clemson University**
The mission of Advanced Technology Systems Laboratory (ATSL) is to pursue cutting-edge research in human-machine systems.
- **Human-Systems Integration Laboratory**
Dr. Chalil Madathil directs the Human Systems Integration Laboratory (HSIL), which is focused on improving the design of human-computer systems. The laboratory, housed in the Fluor Daniel Engineering Innovation Building, applies user-centered design methodologies to develop and refine human-computer systems for a variety of applications within the production and service sectors, including information and knowledge management, collaborative design, quality and process improvement, and education, training, and healthcare. The HSIL involves both undergraduate and graduate students in its research and development activities. Human-Systems Integration Laboratory has access to the following hardware:
 - Eye trackers: The team has access to Tobii Spectrum eye tracking systems. Tobii spectrum eye tracker allows for large head movements, providing a distraction-free test environment that ensures natural behavior. Eye tracking augments traditional usability methods, providing additional information that the test participant cannot report and the researcher cannot

observe. Unique insights about first glance, search patterns, and failed searches have the potential to offer guidance on how to solve different usability problems.

- Immersive and large screen displays: The team has access to three HTC Vive head-mounted displays (HMDs) and Microsoft HoloLens for experimenting with augmented reality. The lab creates augmented reality experiences using Microsoft's HoloLens in conjunction with the Unity development platform. This permits users to experience mixed reality, bringing holographic images and information to the user without interfering with their vision of true reality. The Microsoft HoloLens is a fully untethered holographic computer. HoloLens blends cutting-edge optics and sensors to deliver 3D holograms pinned to the real world.
- Spherical 360° imaging camera: We have access to the Ladybug 3, which records 360° videos similar to Google Street View. The Xbox 360 controller allows for interaction and navigation in virtual environments.
- Wearable devices: We have access to two Empatica E4 devices. This wearable wireless device is designed for continuous, real-time data acquisition in daily life. The system contains four sensors: (1) Photoplethysmography (PPG) to provide blood volume pulse, from which heart rate, heart rate variability, and other cardiovascular features may be derived; (2) Electrodermal activity (EDA) used to measure sympathetic nervous system arousal and to derive features related to stress, engagement, and excitement; (3) 3-axis accelerometer to capture motion-based activity, and (4) Infrared thermopile for reading skin temperature. The device operates either in streaming mode for real-time data viewing on a mobile device using Bluetooth® low energy or in recording mode using its internal memory.

Human-Systems Integration Laboratory has access to the following software:

- NVivo 11: NVivo is a qualitative data analysis computer software package produced by QSR International. It has been designed for qualitative researchers working with very rich text-based and/or multimedia information, where deep levels of analysis on small or large volumes of data are required.
- Atlas.Ti: ATLAS.ti enables researchers to uncover and systematically analyze complex phenomena hidden in unstructured data. The program provides tools that let the user locate, code, and annotate findings in primary data material, to weigh and evaluate their importance, and to visualize the often-complex relations between them. ATLAS.ti consolidates large volumes of documents and keeps track of all notes, annotations, codes, and memos in all fields that require close study and analysis of primary material consisting of text, images, audio, video, and geo data. In addition, it provides analytical and visualization tools designed to open new interpretative views on the material.
- Axure RP Pro prototyping tool: Axure RP Pro is a wireframing and rapid prototyping software tool for web and mobile applications. It offers drag-and-drop placement, resizing, and formatting of widgets.
- Siemens Digital Enterprise Suite: This software is available to the research team and enables the digitalization and streamlining of data from wearable devices to the cloud and vice versa. The open system architecture covers the entire production process and is based on the consistent presence of shared characteristics: consistent data management, global standards, and uniform hardware and software interfaces.
- IBM SPSS Software: The research team has access to IBM SPSS® software platform. It offers advanced statistical analysis, a vast library of machine-learning algorithms, text analysis, open-source extensibility, integration with big data, and seamless deployment into applications.
- Unity3D Software: This software provides a virtual reality developer with the necessary set of features to build games quickly and efficiently. It has a robust framework for virtual reality

development that supports and brings together several core areas. The developers can import art and assets, 2D and 3D, from other software such as Maya, 3s Max, or Photoshop; assemble those assets into scenes and environments; add lighting, audio, special effects, physics, and animation, interactivity, and gameplay logic; and edit, debug, and optimize the content for target platforms.

- Noldus Observer XT: Data synchronization is vital when studying time relationships. The Observer XT is specially designed to synchronously playback multiple modalities. Common modalities include video, screen captures, location data, physiological signals, eye tracking data, FaceReader™ data, and of course behavioral data. The Observer XT will be used to get complete insight in behavior and physiology and take advantage of fully integrated equipment.
- **Automation Robotics and Mechatronics (ARM) Lab**
The ARMLAB where specific emphasis is placed on conception, realization and experimental validation of systems for plant-automation, consumer electronics, automobile and defense applications.
- **Collaborative Robotics and Automation Laboratory**
Research at the lab is mainly focused on robotics and human-robot interaction technologies and applying them to manufacturing and autonomous driving.
- **Siemens Digital Enterprise Suite**
This is available to the Clemson team and enables digitalization and streamline of data from “machines” to the cloud and vice versa.
- **Siemens Product Life-Cycle Management (PLM) Suite**
Siemens provided an in-kind grant valued at more than \$350 million, allowing PLM tools to be incorporated into student coursework and projects. The PLM tools allow students to accelerate their development with realistic simulation scenarios.
- **Watt Family Innovation Center**
This cutting-edge center on Clemson’s main campus is setup to encourage collaboration between students, faculty and leaders in industry and government.
- **Palmetto Cluster**
Clemson’s supercomputer, the Palmetto Cluster, serves the university’s wide-ranging research needs. Developed by Clemson Computing and Information Technology (CCIT) in collaboration with faculty researchers across the university, the Palmetto Cluster is Clemson University's primary highperformance computing (HPC) resource. It is heavily utilized by researchers, students, faculty, and staff from a very broad range of disciplines. External users from other universities, government agencies, and from Clemson's private-sector partners also play significant roles in supporting and using this rapidly growing resource.
- **Cyber-infrastructure Technology Integration**
This organization provides online and in-person training to faculty, staff and students in the basic use of computing resources.
- **Clemson Computing and Information Technology**
This organization is the primary provider of computing resources and IT support for Clemson University. CCIT is providing an integrated approach to high-performance computing environments and traditional computing.

Effective 05/20/2024

NSF BIOGRAPHICAL SKETCH

OMB-3145-0279

IDENTIFYING INFORMATION:**NAME:** Hall, James R**POSITION TITLE:** Vice President, Aviation and WorkForce Development**PRIMARY ORGANIZATION AND LOCATION:** Wichita State University Campus of Applied Sciences and Technology, Wichita, Kansas, United States**Professional Preparation:**

ORGANIZATION AND LOCATION	DEGREE (if applicable)	RECEIPT DATE	FIELD OF STUDY
Wichita State University Campus of Applied Sciences and Technology, Wichita, Kansas, United States	N/A	12/2015	Airframe & Powerplant
Friends Unniversity, Wichita, Kansas, United States	MBA	05/2013	Finance
Friends Univesity, Wichita, Kansas, United States	BBA	08/2011	Logistics
Butler Community Collge, El Dorado, Kansas, United States	AS	05/2009	General Studies
Textron Aviation, Wichita, Kansas, United States	Other training	06/2006 - 06/2007	Six Sigma Green Belt Certification
Textron Aviation, Wichita, Kansas, United States	Other training	06/2005 - 06/2008	Textron Production System Master Trainer

Appointments and Positions

2024 - present Vice President, Aviation and WorkForce Development, Wichita State University Campus of Applied Sciences and Technology, Wichita, Kansas, United States

2020 - 2024 Dean Aviation and Manufacturing , Wichita State University Campus of Applied Sciences and Technology, Wichita, Kansas, United States

2015 - 2020 Dean, Aviation, Wichita State University Campus of Applied Sciences and Technology, Wichita, Kansas, United States

2012 - 2015 Faculty Aviation, Wichita State University Campus of Applied Sciences and Technology, Wichita, Kansas, United States

2011 - 2012 Program Manager King Air, Hawker-Beechcraft, Wichita, Kansas, United States

2001 - 2011 Value StreamLeader, Textron Aviation, Wichita, Arkansas, United States

Products

Products Most Closely Related to the Proposed Project

1. Hall J. Kansas Career and Technical Education Aviation Pathway Curriculum (in collaboration with Textron Aviation and USD 259). 2019 April. Available from: N/A
2. Hall J. Aviation Fundamentals. 2020 July. Available from: N/A
3. Hall J. Aviation Systems. 2020 July. Available from: N/A

Other Significant Products, Whether or Not Related to the Proposed Project

1. Hall J. Hand and Power Tools. 2020 July. Available from: N/A
2. Hall J. Aviation Material. 2020 July. Available from: N/A
3. Hall J. Aviation Engine Performance I & II. 2020 July. Available from: N/A
4. Hall J. Aviation Pneumatics and Hydraulics. 2020 July. Available from: N/A

Certification:

I certify that the information provided is current, accurate, and complete. This includes but is not limited to information related to domestic and foreign appointments and positions.

I also certify that, at the time of submission, I am not a party to a malign foreign talent recruitment program.

Misrepresentations and/or omissions may be subject to prosecution and liability pursuant to, but not limited to, 18 U.S.C. §§ 287, 1001, 1031 and 31 U.S.C. §§ 3729-3733 and 3802.

Certified by Hall, James R in SciENcv on 2025-09-29 12:49:24

Effective 05/20/2024

NSF BIOGRAPHICAL SKETCH

OMB-3145-0279

IDENTIFYING INFORMATION:

NAME: Brenwald, Aaron

POSITION TITLE: Faculty, Avionics

PRIMARY ORGANIZATION AND LOCATION: WSU Tech, Wichita, Kansas, United States

Professional Preparation:

ORGANIZATION AND LOCATION	DEGREE (if applicable)	RECEIPT DATE	FIELD OF STUDY
Redstone College, Broomfield, Colorado, United States	AS	11/2015	Airframe and Powerplant Mechanics
Redstone College, Broomfield, Colorado, United States	AS	05/2014	Advanced Electronics Technology

Appointments and Positions

2023 - present Faculty, Avionics, WSU Tech, Wichita, Kansas, United States

2016 - 2018 Avionics Technician, Textron, Wichita, Kansas, United States

Products**Products Most Closely Related to the Proposed Project**

1. Brenwald A. NC3 Wire Soldering Curriculum. 2024 May. Available from: N/A
2. Brenwald A. NC3 Wire Soldering Student Handbook. 2024 May. Available from: N/A

Other Significant Products. Whether or Not Related to the Proposed Project**Certification:**

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Certified by Brenwald, Aaron in SciENCv on 2025-09-25 12:00:23

Effective 05/20/2024

NSF BIOGRAPHICAL SKETCH

OMB-3145-0279

IDENTIFYING INFORMATION:**NAME:** Kealey, Dawn M**POSITION TITLE:** Assistant Dean, Aviation Technologies**PRIMARY ORGANIZATION AND LOCATION:** WSU Tech, Wichita, Kansas, United States**Professional Preparation:**

ORGANIZATION AND LOCATION	DEGREE (if applicable)	RECEIPT DATE	FIELD OF STUDY
Airbus, Wichita, Kansas, United States	Other training	08/2020 - 08/2020	Airbus General Familiarization Certification
NC3, Wichita, Kansas, United States	Other training	06/2018 - 06/2022	Meters, PETC, Sheetmetal, Torque
Southwestern College, Winfield, Kansas, United States	BS	05/2007	Operations Management & Business Quality Management
Cowley County Community College, Arkansas City, Kansas, United States	MB	05/2003	Aviation Maintenance Technology
Federal Aviation Administration, Wichita, Kansas, United States	Other training	08/2000 - 05/2002	Airmen Mechanic Certificate with Airframe & Powerplant Ratings

Appointments and Positions

2022 - present Assistant Dean, Aviation Technologies, WSU Tech, Wichita, Kansas, United States

2017 - 2022 Program Director, Aviation Technologies, WSU Tech, Wichita, Kansas, United States

2014 - 2017 Program Director, Employer Services, WSU Tech, Wichita, Kansas, United States

2008 - 2014 Faculty, Aviation Maintenance, WSU Tech, Wichita, Kansas, United States

2003 - 2008 Faculty, Aviation Maintenance, Cowley County Community College, Wichita, Kansas, United States

1988 - 1990 US Army Reserves, US Military, Wichita, Kansas, United States

Products**Products Most Closely Related to the Proposed Project**

1. Kealey DM. Choose Aerospace Aviation Maintenance Curriculum (Contributing Author).. 2024 July. Available from: n/a
2. Kealey DM. WSU Tech Aviation Maintenance Technology Operations Manual - 8 Week & Hybrid Modality. 2023 August. Available from: n/a
3. Kealey DM. , WSU Tech Aviation Maintenance Technology Operations Manual. 2017 August. Available from: n/a
4. Kealey DM. Wichita Area Technical College Aviation Tech Center Operations Manual. 2008 August. Available from: n/a
5. Kealey DM. Cowley County Community College Aviation Tech Center Operations Manual. 2004 August. Available from: n/a

Other Significant Products. Whether or Not Related to the Proposed Project

Certification:

I certify that the information provided is current, accurate, and complete. This includes but is not limited to information related to domestic and foreign appointments and positions.

I also certify that, at the time of submission, I am not a party to a malign foreign talent recruitment program.

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Certified by Kealey, Dawn M in SciENcv on 2025-09-24 13:15:37

Effective 05/20/2024

NSF BIOGRAPHICAL SKETCH

OMB-3145-0279

IDENTIFYING INFORMATION:

NAME: Crow, Adam L

POSITION TITLE: Aviation Instructor

PRIMARY ORGANIZATION AND LOCATION: Calhoun Community College, Decatur, Alabama, United States

Professional Preparation:

ORGANIZATION AND LOCATION	DEGREE (if applicable)	RECEIPT DATE	FIELD OF STUDY
Enterprise State Community College, Decatur, Alabama, United States	AS	05/2010	Aviation Maintenance

Appointments and Positions

2025 - present Aviation Instructor, Calhoun Community College, Decatur, Alabama, United States

2022 - 2025 Sr. Lead Integration Engineer, Blue Origin, Huntsville, Alabama, United States

2022 - 2022 Multi-Skilled Maintenance, Mazda-Toyota Manufacturing, Huntsville, Alabama, United States

2017 - 2021 Propeller Shop Supervisor, Segers Aero, Fairhope, Alabama, United States

2013 - 2017 Capabilities Manager/Supervisor, CAS Components, Fairhope, Alabama, United States

2011 - 2013 Aviation Maintenance Technician, PHI, Lafayette, Louisiana, United States

2008 - 2011 Pneumatic/Hydraulic Component Specialist, Fokker AirInc, Fairhope, Alabama, United States

Products*Products Most Closely Related to the Proposed Project**Other Significant Products, Whether or Not Related to the Proposed Project***Certification:**

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I also certify that, at the time of submission, I am not a party to a malign foreign talent recruitment program.

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Certified by Crow, Adam L in SciENcv on 2025-09-09 12:10:01

Effective 05/20/2024

NSF BIOGRAPHICAL SKETCH

OMB-3145-0279

IDENTIFYING INFORMATION:

NAME: Sasso, Michael Richard

POSITION TITLE: Aircraft Maintenance Chief

PRIMARY ORGANIZATION AND LOCATION: Aims Community College, Greeley, Colorado, United States

Professional Preparation:

ORGANIZATION AND LOCATION	DEGREE (if applicable)	RECEIPT DATE	FIELD OF STUDY
Spartan School of Aeronautics and College, Tulsa, Oklahoma, United States	AS	12/1985	Avionics

Appointments and Positions

2024 - present Aircraft Maintenance Chief, Aims Community College, Greeley, Colorado, United States

2021 - 2024 Asst. Dean, Program Director, Aviation Maintenance Technology, Cape Cod Community College, Plymouth, Massachusetts, United States

2017 - 2021 Campus Director of Education, Aviation Institute of Maintenance, Charlotte, North Carolina, United States

2012 - 2017 Aviation Maintenance Associate Professor, Rock Valley College, Rockford, Illinois, United States

Products*Products Most Closely Related to the Proposed Project**Other Significant Products, Whether or Not Related to the Proposed Project***Certification:**

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I also certify that, at the time of submission, I am not a party to a malign foreign talent recruitment program.

Misrepresentations and/or omissions may be subject to prosecution and liability pursuant to, but not limited to, 18 U.S.C. §§ 287, 1001, 1031 and 31 U.S.C. §§ 3729-3733 and 3802.

Certified by Sasso, Michael Richard in SciENcv on 2025-09-25 16:58:20

Effective 05/20/2024

NSF BIOGRAPHICAL SKETCH

OMB-3145-0279

IDENTIFYING INFORMATION:

NAME: Schriber, Burton R

POSITION TITLE: Aviation Maintenance Instructor

PRIMARY ORGANIZATION AND LOCATION: AIMS Community College, Greeley,
Colorado, United States**Professional Preparation:**

ORGANIZATION AND LOCATION	DEGREE (if applicable)	RECEIPT DATE	FIELD OF STUDY
SUNY Stony Brook, Stony Brook, New York, United States	BS	06/1981	Aerospace Engineering
Academy of Aeronautics, Queens, New York, United States	AS	06/1978	Aircraft Maintenance
SUNY Farmingdale, Farmingdale, New York, United States	AS	06/1974	Aerospace Technology

Appointments and Positions2025 - present Aviation Maintenance Instructor, AIMS Community College, Greeley,
Colorado, United States2018 - 2024 AMT Instructor, Cape Cod Community College, Plymouth, Massachusetts,
United States

2009 - 2010 AMT Instructor, East Coast Aero Tech, Bedford, Massachusetts, United States

Products*Products Most Closely Related to the Proposed Project**Other Significant Products, Whether or Not Related to the Proposed Project***Certification:**

I certify that the information provided is current, accurate, and complete. This includes but is not limited to information related to domestic and foreign appointments and positions.

I also certify that, at the time of submission, I am not a party to a malign foreign talent recruitment program.

Misrepresentations and/or omissions may be subject to prosecution and liability pursuant to, but not limited to, 18 U.S.C. §§ 287, 1001, 1031 and 31 U.S.C. §§ 3729-3733 and 3802.

Certified by Schriber, Burton R in SciENcv on 2025-09-25 17:23:16

Effective 05/20/2024

NSF BIOGRAPHICAL SKETCH

OMB-3145-0279

IDENTIFYING INFORMATION:**NAME:** Chalil Madathil, Kapil**POSITION TITLE:** Wilfred P. Tiencken Professor**PRIMARY ORGANIZATION AND LOCATION:** Clemson University, Departments of Industrial and Civil Engineering, Clemson, South Carolina, United States**Professional Preparation:**

ORGANIZATION AND LOCATION	DEGREE (if applicable)	RECEIPT DATE	FIELD OF STUDY
Clemson University, Clemson , South Carolina, United States	PHD	12/2013	Industrial Engineering (Human Factors)
Clemson University, Clemson, South Carolina, United States	MS	08/2010	Industrial Engineering (Human Factors)
Vellore Institute of Technology, Vellore, Not Applicable, N/A, India	BS	06/2006	Mechanical Engineering

Appointments and Positions

2023 - present Wilfred P. Tiencken Professor, Clemson University, Departments of Industrial and Civil Engineering, Clemson, South Carolina, United States

2016 - present Adjunct Professor, Department of Public Health Sciences College of Medicine, Medical University of South Carolina, Charleston, South Carolina, United States

2014 - present Director of Technology Operations, Clemson University Center for Workforce Development, Clemson, South Carolina, United States

2021 - 2023 Wilfred P. Tiencken Associate Professor, Clemson University, Clemson, South Carolina, United States

2015 - 2021 Wilfred P. Tiencken Assistant Professor, Departments of Civil and Industrial Engineering, Clemson University, Clemson, South Carolina, United States

2014 - 2015 Research Assistant Professor, Department of Industrial Engineering, Clemson University, Clemson, South Carolina, United States

Products**Products Most Closely Related to the Proposed Project**

1. Upadhyay B, Brady C, Chalil Madathil K, Bertrand J, McNeese NJ, Gramopadhye A. Collaborative augmented reality in higher education: A systematic review of effectiveness, outcomes, and challenges. Appl Ergon. 2024 Nov;121:104360. PubMed PMID: [39127028](#).
2. Upadhyay B, Madathil KC, Bertrand J, Rosopa E, Ballato J, Verlage E, Saini S, Kimerling LC, Gramopadhye A. Virtual reality enabled asynchronous learning modules for fiber optic preform

- manufacturing education. Appl Opt. 2023 Nov 1;62(31):H1-H8. PubMed PMID: [38037917](#).
3. Bhargava A, Bertrand JW, Gramopadhye AK, Madathil KC, Babu SV. Evaluating Multiple Levels of an Interaction Fidelity Continuum on Performance and Learning in Near-Field Training Simulations. IEEE Trans Vis Comput Graph. 2018 Apr;24(4):1418-1427. PubMed PMID: [29543160](#).
 4. Bertrand J, Bhargava A, Madathil K, Gramopadhye A, Babu S. The effects of presentation method and simulation fidelity on psychomotor education in a bimanual metrology training simulation. 2017 IEEE Symposium on 3D User Interfaces (3DUI). 2017; :59-68. isbn: 1509067167
 5. Madathil K, Frady K, Hartley R, Bertrand J, Alfred M, Gramopadhye A. An empirical study investigating the effectiveness of integrating virtual reality-based case studies into an online asynchronous learning environment. The ASEE Computers in Education (CoED) Journal. 2017; 8(3).

Other Significant Products, Whether or Not Related to the Proposed Project

1. Kolangarakath A, Chalil Madathil K, Hegde S, Agrawal S, Bian M, Simmons L, Molloseau G, Holmstedt C, LeBlanc D, Harvey J, McGeorge T, Spampinato M, Roberts D. Barriers to integrating portable Magnetic Resonance Imaging systems in emergency medical service ambulances for stroke care. Ergonomics. 2024 Dec;67(12):1938-1957. PubMed PMID: [38916114](#).
2. Sawant S, Madathil KC, Molloseau M, Obeid J. Overcoming recruitment hurdles in clinical trials: An investigation of remote consenting modalities and their impact on workload, workflow, and usability. Appl Ergon. 2024 Jan;114:104135. PubMed Central PMCID: [PMC10843021](#).
3. Chalil Madathil K, Greenstein JS. An investigation of the efficacy of collaborative virtual reality systems for moderated remote usability testing. Appl Ergon. 2017 Nov;65:501-514. PubMed PMID: [28256209](#).
4. Agnisarman SO, Chalil Madathil K, Smith K, Ashok A, Welch B, McElligott JT. Lessons learned from the usability assessment of home-based telemedicine systems. Appl Ergon. 2017 Jan;58:424-434. PubMed PMID: [27633239](#).
5. Torrence C, Bhanu A, Bertrand J, Dye C, Truong K, Madathil KC. Preparing future health care workers for interactions with people with dementia: A mixed methods study. Gerontol Geriatr Educ. 2023 Apr-Jun;44(2):223-242. PubMed PMID: [35393916](#).

Certification:

I certify that the information provided is current, accurate, and complete. This includes but is not limited to information related to domestic and foreign appointments and positions.

I also certify that, at the time of submission, I am not a party to a malign foreign talent recruitment program.

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Certified by Chalil Madathil, Kapil in SciENcv on 2025-09-25 10:37:35

Effective 05/20/2024

NSF BIOGRAPHICAL SKETCH

OMB-3145-0279

IDENTIFYING INFORMATION:

NAME: Gramopadhye, Ph.D., Anand K

ORCID iD: <https://orcid.org/0009-0002-4913-7721>

POSITION TITLE: Dean-College of Engineering, Computing and Applied Science

PRIMARY ORGANIZATION AND LOCATION: Clemson University, Clemson, South Carolina, United States

Professional Preparation:

ORGANIZATION AND LOCATION	DEGREE (if applicable)	RECEIPT DATE	FIELD OF STUDY
State University of New York, Buffalo, New York, United States	PHD	05/1992	Industrial Engineering
State University of New York, Buffalo, New York, United States	MS	05/1989	Industrial Engineering
VJTI University of Bombay, Bombay, Not Applicable, N/A, India	BS	05/1987	Production Engineering

Appointments and Positions

2013 - present	Dean-College of Engineering, Computing and Applied Science, Clemson University, Clemson, South Carolina, United States
2001 - present	Professor, Industrial Engineering, College of Engineering, Computing and Applied Sciences, Clemson University, Industrial Engineering, College of Engineering, Computing and Applied Sciences, Clemson, South Carolina, United States
2003 - 2013	Chair-Industrial Engineering, College of Engineering, Computing and Applied Science, Clemson University, Clemson, South Carolina, United States
1998 - 2001	Associate Professor, Industrial Engineering, College of Engineering, Computing and Applied Sciences, Clemson University, Clemson, South Carolina, United States
1992 - 1998	Assistant Professor, Industrial Engineering, College of Engineering, Computing and Applied Sciences, Clemson University, Clemson, South Carolina, United States

Products**Products Most Closely Related to the Proposed Project**

1. Ponathil A, Gramopadhye A, Chalil Madathil K. Decision Aids in Online Review Portals: An Empirical Study Investigating Their Effectiveness in the Sensemaking Process of Online Information Consumers. Multimodal Technologies and Interaction. 2020 June 23; 4(2):32-. Available from: <https://www.mdpi.com/2414-4088/4/2/32> DOI: 10.3390/mti4020032
2. Syed Z.A., Trabookis Z., Bertrand J.W., Madathil K.C., Hartley R.S., Frady K.K., Wagner J.R., Gramopadhye A.K.. Evaluation of virtual reality based learning materials as a supplement to the undergraduate mechanical engineering laboratory experience. International Journal of Engineering Education. 2019; 35(3):842-852. Available from: <http://www.scopus.com/inward/record.url?eid=2-s2.0-85073657672&partnerID=MN8TOARS> eid: 2-s2.0-85073657672

3. Madathil K.C., Frady K., Hartley R., Bertrand J., Alfred M., Gramopadhye A.. An empirical study investigating the effectiveness of integrating virtual reality-based case studies into an online asynchronous learning environment. Computers in Education Journal. 2017; 8(3). Available from: <http://www.scopus.com/inward/record.url?eid=2-s2.0-85051237091&partnerID=MN8TOARS> eid: 2-s2.0-85051237091
4. Agnisarman S, Madathil K, Bertrand J, Piratla K, Gajjar D, Gramopadhye A. Context enabled decision aids to support the situation awareness and performance of risk engineers carrying out loss prevention surveys. International Journal of Industrial Ergonomics. 2021 May; 83:103108-. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0169814121000263> DOI: 10.1016/j.ergon.2021.103108
5. Bhargava A, Bertrand J, Gramopadhye A, Madathil K, Babu S. Evaluating Multiple Levels of an Interaction Fidelity Continuum on Performance and Learning in Near-Field Training Simulations. IEEE Transactions on Visualization and Computer Graphics. 2018; 24(4):1418-1427. Available from: <http://ieeexplore.ieee.org/document/8260967/> DOI: 10.1109/TVCG.2018.2794639

Other Significant Products, Whether or Not Related to the Proposed Project

1. Subramanian R.C., Jacob R.J., Gramopadhye A.K.. An error taxonomic approach to define training needs for inspection training. IIE Annual Conference and Exhibition 2004. IIE Annual Conference and Exhibition 2004; 2004; c2004. Available from: <http://www.scopus.com/inward/record.url?eid=2-s2.0-30044452024&partnerID=MN8TOARS> eid: 2-s2.0-30044452024
2. Liebholt V, Kimbler D, Gramopadhye A. A Profit-Based Model Allowing for Quality Achievement and Manufacturing Process Selection. Quality Engineering. 2002 January; 14(1):25-32. Available from: <http://www.tandfonline.com/doi/abs/10.1081/QEN-100106883> DOI: 10.1081/QEN-100106883
3. Master R, Jiang X, Khasawneh M, Bowling S, Grimes L, Gramopadhye A, Melloy B. Measurement of trust over time in hybrid inspection systems. Human Factors and Ergonomics in Manufacturing. 2005; 15(2):177-196. Available from: <https://onlinelibrary.wiley.com/doi/10.1002/hfm.20021> DOI: 10.1002/hfm.20021
4. Alfred M, Lee M, Neyens D, Gramopadhye A. Learning in Simulated Environments: A Comparison to Learning in a Physical Environments Using Video Data Analysis. Proceedings of the Human Factors and Ergonomics Society Annual Meeting. 2017 October 20; 61(1):1839-1843. Available from: <http://journals.sagepub.com/doi/10.1177/1541931213601940> DOI: 10.1177/1541931213601940
5. Upadhyay B, Madathil K, Bertrand J, Rosopa E, Ballato J, Verlage E, Saini S, Kimerling L, Gramopadhye A. Virtual reality enabled asynchronous learning modules for fiber optic preform manufacturing education. Applied Optics. 2023 June 02; 62(31):H1-. Available from: <https://opg.optica.org/abstract.cfm?URI=ao-62-31-H1> DOI: 10.1364/AO.491404

Certification:

I certify that the information provided is current, accurate, and complete. This includes but is not limited to current, pending, and other support (both foreign and domestic) as defined in 42 U.S.C. §

6605.

I also certify that, at the time of submission, I am not a party to a malign foreign talent recruitment program.

Misrepresentations and/or omissions may be subject to prosecution and liability pursuant to, but not limited to, 18 U.S.C. §§ 287, 1001, 1031 and 31 U.S.C. §§ 3729-3733 and 3802.

Certified by Gramopadhye, Ph.D., Anand K in SciENcv on 2024-05-24 09:05:01

Effective 05/20/2024

NSF BIOGRAPHICAL SKETCH

OMB-3145-0279

IDENTIFYING INFORMATION:

NAME: Bertrand, Jeff

POSITION TITLE: Director of Visualizations

PRIMARY ORGANIZATION AND LOCATION: Clemson University Center for Workforce Development, Clemson, South Carolina, United States

Professional Preparation:

ORGANIZATION AND LOCATION	DEGREE (if applicable)	RECEIPT DATE	FIELD OF STUDY
Clemson University, Clemson, South Carolina, United States	PHD	12/2016	Human Centered Computing
University of Iowa, Iowa City, Iowa, United States	BA	05/2010	Informatics
University of Iowa, Iowa City, Iowa, United States	BA	05/2010	Art

Appointments and Positions

2016 - present	Director of Visualizations, Clemson University Center for Workforce Development, Clemson, South Carolina, United States
2013 - 2016	Software Analyst, Clemson University Center for Workforce Development, Clemson, South Carolina, United States
2010 - 2016	Research Assistant, CyberInnovations Lab, Clemson, South Carolina, United States
2009 - 2010	Research Assistant, University of Iowa Hank Virtual Environments Lab, Iowa City, Iowa, United States

Products**Products Most Closely Related to the Proposed Project**

1. Torrence C, Bhanu A, Bertrand J, Dye C, Truong K, Madathil KC. Preparing future health care workers for interactions with people with dementia: A mixed methods study. Gerontol Geriatr Educ. 2023 Apr-Jun;44(2):223-242. PubMed PMID: [35393916](#).
2. Upadhyay Bhargav, Madathil Kapil Chalil, Bertrand Jeffrey, Rosopa Elenah, Ballato John, Verlage Erik, Saini Sajan, Kimerling Lionel C, Gramopadhye Anand. Virtual reality enabled asynchronous learning modules for fiber optic preform manufacturing education. Applied Optics. 2023; 62(31):H1--H8.
3. Agnisarman Sruthy, Madathil Kapil Chalil, Bertrand Jeffrey, Piratla Kalyan, Gajjar Dhaval, Gramopadhye Anand. Context enabled decision aids to support the situation awareness and performance of risk engineers carrying out loss prevention surveys. International Journal of Industrial Ergonomics. 2021; 83:103108.
4. Syed Zaker A, Trabookis Zachary, Bertrand Jeffrey, Chalil Madathil Kapil, Hartley Rebecca S, Frady Kristin K, Wagner John R, Gramopadhye Anand K. Evaluation of virtual reality based learning materials as a supplement to the undergraduate mechanical engineering laboratory experience. International Journal of Engineering Education. 2019; 35(3).
5. Bhargava Ayush, Bertrand Jeffrey W, Gramopadhye Anand K, Madathil Kapil C, Babu Sabarish V. Evaluating multiple levels of an interaction fidelity continuum on performance and

learning in near-field training simulations. IEEE transactions on visualization and computer graphics. 2018; 24(4):1418--1427.

Other Significant Products, Whether or Not Related to the Proposed Project

1. Narasimha S, Dixon E, Bertrand J, Madathil K. An empirical study to investigate the efficacy of collaborative immersive virtual reality systems for designing information architecture of software systems. Applied ergonomics. 2019; 80:175-186. issn: 0003-6870
2. Gupta M, Bertrand J, Babu S, Polgreen P, Segre A. An evolving multi-agent scenario generation framework for simulations in preventive medicine education. Proceedings of the 2nd ACM SIGHIT International Health Informatics Symposium. 2012; :237-246.
3. Syed Z, Trabookis Z, Bertrand J, Chalil Madathil K, Hartley R, Frady K, Wagner J, Gramopadhye A. Evaluation of virtual reality based learning materials as a supplement to the undergraduate mechanical engineering laboratory experience. International journal of engineering education. 2019; 35(3).
4. Madathil Kapil Chalil, Frady Kristin, Hartley Rebecca, Bertrand Jeffrey, Alfred Myrte, Gramopadhye Anand. An empirical study investigating the effectiveness of integrating virtual reality-based case studies into an online asynchronous learning environment. Computers in Education Journal. 2017; 8(3).
5. Lopes S, Chalil Madathil K, Bertrand J, Brady C, Li D, McNeese N. Effect of Mental Fatigue on Trust and Workload with AI-enabled Infrastructure Visual Inspection Systems. Proceedings of the Human Factors and Ergonomics Society Annual Meeting. 2022; 66(1):285-286. issn: 2169-5067

Certification:

I certify that the information provided is current, accurate, and complete. This includes but is not limited to current, pending, and other support (both foreign and domestic) as defined in 42 U.S.C. § 6605.

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Certified by Bertrand, Jeff in SciENcv on 2024-09-18 16:21:06

Effective 05/20/2024

NSF BIOGRAPHICAL SKETCH

OMB-3145-0279

IDENTIFYING INFORMATION:

NAME: Short, Rebecca

POSITION TITLE: Director of Operations

PRIMARY ORGANIZATION AND LOCATION: Clemson University Center for Workforce Development, Clemson, SC, United States

Professional Preparation:

ORGANIZATION AND LOCATION	DEGREE (if applicable)	RECEIPT DATE	FIELD OF STUDY
Auburn University, Auburn, AL, United States	PHD	05/2015	Public Administration and Public Policy
Auburn University, Auburn, AL, United States	MPA	05/2004	Public Administration
Western Carolina University, Cullowhee, NC, United States	BS	05/1999	Criminology

Appointments and Positions

2016 - present	Director of Operations, Clemson University Center for Workforce Development, Clemson, SC, United States
2017 - 2019	Chief Workforce Officer, Advanced Robotics for Manufacturing (ARM) Institute, Pittsburgh, PA, United States
2013 - 2016	Director of Career Pathways, Clemson University Center for Workforce Development, Clemson, SC, United States
2005 - 2012	Director of Graduate Admissions and Records, University of Montevallo, Montevallo, AL, United States
2002 - 2004	Graduate Research and Teaching Assistant, Auburn University, Auburn, AL, United States
1999 - 2002	Assistant Director of Admissions, Western Carolina University, Cullowhee, NC, United States

Products**Products Most Closely Related to the Proposed Project**

1. Shakour K, Ransom T, Gallagher E, Short R, Johnson K, Anoop G, Beck J, Chalil Madathil K. Aviation Maintenance Technology Schools Response to the COVID-19 Pandemic.. ASEE NSF Grantees Poster Session; 2022 May; Minneapolis, MN.
2. Rangaraju N, Turner M, Agha Z, Shakour K, Bertrand J, Short R, Chalil Madathil KC. The effects of virtual reality on STEM students' learning outcomes for aircraft materials, hardware, and processes.. 7th Annual Summer Undergraduate Research Symposium; 2022 July; Clemson, SC, United States.
3. Adams E, Dukes R, Prabhakar D, Shakour K, Bertrand J, Short R, Chalil Madathil KC. Understanding the effectiveness of virtual reality in education: a case study using aviation fluid lines educational content. 7th Annual Summer Undergraduate Research Symposium; 2022 July; Clemson, SC, United States.

4. Shakour K, Gallagher E, Ransom T, Johnson K, Short R, Beck J, Chalil Madathil K. "The COVID-19 pandemic's effect on student learning at aviation maintenance technology schools.". *New Directions For Community Colleges*. 2024; 2024(205):143-151. Available from: <https://doi.org/10.1002/cc.20619>
5. Anoop G, Kolangarakath A, Chalil Madathil K, Shakour K, Ransom T. Transitioning Lab Courses to Online Platforms by Higher Education Institutions during COVID-19: Strategies, Learning Outcomes, Perceptions, and Challenges. . *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*. 2024.

Other Significant Products, Whether or Not Related to the Proposed Project

1. Shakour K, Ransom T, Chalil Madathil K, Johnson K, Beck J, Short R. The COVID-19 pandemic's effect on student learning at aviation maintenance technology schools. *Aviation Technician Education Journal*. Fall 2021; 43(1).
2. Jain M, Chalil Madathil K, Morris T, Shakour K, Johnson K, Beck J, Short R. Challenges presented by COVID-19 pandemic at colleges offering aviation maintenance technology programs.. *IISE Annual Virtual Conference*; 2021 May.
3. Shakour K, Chalil Madathil K, Short R, Gallagher E. Aviation Maintenance Technology (AMT) Programs' Response to the COVID-19 Pandemic: Preliminary Results.. *High Impact Technology Exchange Conference*; 2021 June; Virtual.

Certification:

I certify that the information provided is current, accurate, and complete. This includes but is not limited to current, pending, and other support (both foreign and domestic) as defined in 42 U.S.C. § 6605.

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Certified by Short, Rebecca in SciENcv on 2024-09-19 11:31:25

Other Personnel Biographical Information

Data Not Available

Other Personnel Biographical Information

Data Not Available

CURRENT AND PENDING (OTHER) SUPPORT INFORMATION

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person.

*NAME: Hall, James

*POSITION TITLE: Vice-President, Aviation & Workforce Development

*ORGANIZATION AND LOCATION: Wichita State Campus of Applied Sciences and Technology, Wichita, Kansas, United States

Proposals/Active Projects

*Proposal/Active Project Title: Kansas Choose Aerospace

*Status of Support: Current

Proposal/Award Number:

*Source of Support: Department of Education

*Primary Place of Performance: WSU Tech, Wichita, Kansas, USA

*Proposal/Active Project Start Date: (MM/YYYY): 09/2024

*Proposal/Active Project End Date: (MM/YYYY): 08/2027

*Total Anticipated Proposal/Project Amount: \$1,000,000

* Person Months per budget period Devoted to the Proposal/Active Project:

Year	Person Months
2024	0.2
2025	0.52
2026	0.36
2027	0.24

***Overall Objectives:** WSU Tech serves as the lead institution on this three-year federally funded initiative to expand access to aviation maintenance career pathways for high school students across Kansas. James Hall oversees program implementation, including the establishment of Choose Aerospace curriculum at six high schools, coordination of faculty training, and integration of virtual instruction led by WSU Tech AMT instructors. The project aims to increase enrollment, program completion, and credential attainment by supporting school-based labs, instructor stipends, and student certification costs, with long-term sustainability tied to increased Excel in CTE funding and institutional investment.

***Statement of Potential Overlap:** There is no scientific, budgetary, or effort overlap between the Choose Aerospace Congressionally Directed Spending (CDS) appropriation (Kansas Choose Aerospace) and the proposed NSF ATE AVIATE project. The CDS appropriation supports dissemination of the existing Aviation Maintenance Technician (AMT) curriculum in Kansas high schools, focusing on airframe and powerplant systems. In contrast, the NSF ATE AVIATE project will develop and nationally deploy a new avionics curriculum addressing navigation, communication, and electronic systems across a four-state consortium. The

CDS project funds only AMT curriculum implementation, while the NSF ATE project funds new curriculum creation in avionics; personnel, activities, and deliverables are distinct. The two projects are complementary, with the NSF ATE work expanding the Choose Aerospace platform by adding a separate avionics pathway without duplicating AMT content

***Proposal/Active Project Title:** Collaborative Research: AVIATE (Advancing AVionics in American Technical Education), a National ATE Consortium

***Status of Support:** Pending

Proposal/Award Number:

***Source of Support:** National Science Foundation

***Primary Place of Performance:** WSU Tech, Wichita, Kansas, USA

***Proposal/Active Project Start Date: (MM/YYYY):** 07/2026

***Proposal/Active Project End Date: (MM/YYYY):** 06/2029

***Total Anticipated Proposal/Project Amount:** \$1,941,885

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2026	0.3
2027	0.6
2028	0.6
2029	0.3

***Overall Objectives:** Through AVIATE, the consortium will create and integrate evidence-based curricula, deploy immersive learning technologies, align programs with industry-defined competencies, and implement avionics content across participating institutions. AVIATE will strengthen avionics career pathways, expand training capacity, and ensure the U.S. maintains global leadership in aviation safety, innovation, defense readiness, and workforce development.

***Statement of Potential Overlap:** There is no scientific, budgetary, or effort overlap between the Choose Aerospace Congressionally Directed Spending (CDS) appropriation (Kansas Choose Aerospace) and the proposed NSF ATE AVIATE project. The CDS appropriation supports dissemination of the existing Aviation Maintenance Technician (AMT) curriculum in Kansas high schools, focusing on airframe and powerplant systems. In contrast, the NSF ATE AVIATE project will develop and nationally deploy a new avionics curriculum addressing navigation, communication, and electronic systems across a four-state consortium. The CDS project funds only AMT curriculum implementation, while the NSF ATE project funds new curriculum creation in avionics; personnel, activities, and deliverables are distinct. The two projects are complementary, with the NSF ATE work expanding the Choose Aerospace platform by adding a separate avionics pathway without duplicating AMT content

***Proposal/Active Project Title:** Acoustic Profiling for Advanced Air Mobility (AAM) Integration

***Status of Support:** Pending

Proposal/Award Number:

***Source of Support:** Department of Defense

***Primary Place of Performance:** WSU Tech, Wichita, Kansas, USA

***Proposal/Active Project Start Date: (MM/YYYY):** 10/2025

***Proposal/Active Project End Date: (MM/YYYY):** 09/2026

***Total Anticipated Proposal/Project Amount:** \$877,652

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2025	0.06
2026	0.18

***Overall Objectives:** This project will acquire equipment to conduct a baseline research initiative to spatially analyze the acoustic signatures of multiple unmanned aircraft platforms. This research will also expand WSU Tech's applied research capacity in AAM and uncrewed systems.

***Statement of Potential Overlap:** None

***Proposal/Active Project Title:** Taking Flight – Professional Pilot Pipeline (TFP)

***Status of Support:** Pending

Proposal/Award Number:

***Source of Support:** DOT Federal Aviation Administration

***Primary Place of Performance:** WSU Tech, Wichita, Kansas, USA

***Proposal/Active Project Start Date: (MM/YYYY):** 10/2025

***Proposal/Active Project End Date: (MM/YYYY):** 09/2027

***Total Anticipated Proposal/Project Amount:** \$565,194

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2025	0.03
2026	0.12
2027	0.9

***Overall Objectives:** WSU Tech leads a statewide initiative designed to introduce high school students, particularly those from rural and underserved communities, to professional pilot careers. Through partnerships with Kansas school districts, the project delivers dual-credit ground school courses using the Cessna Flight Training System curriculum and trains high school instructors through boot camps and ongoing support. Students gain college credit, prepare for the FAA Knowledge Exam, and have the opportunity to continue their training through advanced summer aviation courses. By building a pipeline of students and certified instructors across seven districts, the TFP project supports workforce development, educational equity, and the expansion of Kansas' aviation sector.

***Statement of Potential Overlap:** This outreach and career exploration initiative is distinct from and does not overlap with the NSF ATE proposal, which focuses on Choose Aerospace - Aviation curriculum development.

***Proposal/Active Project Title:** Wings to the Workforce: Accelerated FAA Part 65 A&P Training for transitioning, active-duty, nonactive duty, reserve component personnel, and veterans of the armed forces.

***Status of Support:** Pending

Proposal/Award Number:

***Source of Support:** DOT Federal Aviation Administration

***Primary Place of Performance:** WSU Tech, Wichita, Kansas, USA

***Proposal/Active Project Start Date: (MM/YYYY):** 10/2025

***Proposal/Active Project End Date: (MM/YYYY):** 09/2027

***Total Anticipated Proposal/Project Amount:** \$986,807

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2025	0.03
2026	0.12
2027	0.09

***Overall Objectives:** WSU Tech's Wings to the Workforce project delivers accelerated FAA Part 65 A&P training to 180 transitioning military personnel, including active duty, non-active duty, reserve component members, and veterans. Building on WSU Tech's existing Skill Bridge programming, the project expands outreach across nine military bases in five states and integrates targeted marketing, veteran support services, and employer engagement to connect participants to high-demand, well-paying jobs in aviation maintenance. Training is delivered at Textron Aviation's Career and Learning Center using WSU Tech's equipment and curriculum, with a goal of 90% certification and 95% job placement within six months.

***Statement of Potential Overlap:** This outreach and career exploration initiative is distinct from and does not overlap with the NSF ATE proposal, which focuses on Choose Aerospace - Aviation curriculum development.

Certification:

I certify that the information provided is current, accurate, and complete. This includes but is not limited to current, pending, and other support (both foreign and domestic) as defined in 42 U.S.C. § 6605.

I also certify that, at the time of submission, I am not a party to a malign foreign talent recruitment program.

Misrepresentations and/or omissions may be subject to prosecution and liability pursuant to, but not limited to, 18 U.S.C. §§ 287, 1001, 1031 and 31 U.S.C. §§ 3729-3733 and 3802.

Certified by Hall, James in SciENcv on 2025-10-01 11:22:02

CURRENT AND PENDING (OTHER) SUPPORT INFORMATION

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person.

*NAME: Brenwald, Aaron

*POSITION TITLE: Faculty, Avionics

*ORGANIZATION AND LOCATION: WSU Tech, Wichita, Kansas, United States

Proposals/Active Projects

***Proposal/Active Project Title:** Collaborative Research: AVIATE (Advancing AVionics in American Technical Education), a National ATE Consortium

***Status of Support:** Pending

***Proposal/Award Number:**

***Source of Support:** National Science Foundation

***Primary Place of Performance:** WSU Tech, Wichita, KS, United States

***Proposal/Active Project Start Date: (MM/YYYY):** 07/2026

***Proposal/Active Project End Date: (MM/YYYY):** 06/2029

***Total Anticipated Proposal/Project Amount:** \$1,941,885

* **Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2026	0.3
2027	0.6
2028	0.6
2029	0.3

***Overall Objectives:** Through AVIATE, the consortium will create and integrate evidence-based curricula, deploy immersive learning technologies, align programs with industry-defined competencies, and implement avionics content across participating institutions. AVIATE will strengthen avionics career pathways, expand training capacity, and ensure the U.S. maintains global leadership in aviation safety, innovation, defense readiness, and workforce development.

***Statement of Potential Overlap:** None

Certification:

I certify that the information provided is current, accurate, and complete. This includes but is not limited to

current, pending, and other support (both foreign and domestic) as defined in 42 U.S.C. § 6605.

I also certify that, at the time of submission, I am not a party to a malign foreign talent recruitment program.

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Certified by Brenwald, Aaron in SciENCv on 2025-10-01 11:15:48

CURRENT AND PENDING (OTHER) SUPPORT INFORMATION

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person.

*NAME: Kealey, Dawn

*POSITION TITLE: Assistant Dean, Aviation Technologies

*ORGANIZATION AND LOCATION: WSU Tech, Wichita, Kansas, United States

Proposals/Active Projects

***Proposal/Active Project Title:** Collaborative Research: AVIATE (Advancing AVionics in American Technical Education), a National ATE Consortium

***Status of Support:** Pending

***Proposal/Award Number:**

***Source of Support:** National Science Foundation

***Primary Place of Performance:** WSU Tech

***Proposal/Active Project Start Date: (MM/YYYY):** 07/2026

***Proposal/Active Project End Date: (MM/YYYY):** 06/2029

***Total Anticipated Proposal/Project Amount:** \$1,941,885

* **Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2026	0.3
2027	0.6
2028	0.6
2029	0.3

***Overall Objectives:** Through AVIATE, the consortium will create and integrate evidence-based curricula, deploy immersive learning technologies, align programs with industry-defined competencies, and implement avionics content across participating institutions. AVIATE will strengthen avionics career pathways, expand training capacity, and ensure the U.S. maintains global leadership in aviation safety, innovation, defense readiness, and workforce development.

***Statement of Potential Overlap:** None

Certification:

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current, pending, and other support (both foreign and domestic) as defined in 42 U.S.C. § 6605.

I also certify that, at the time of submission, I am not a party to a malign foreign talent recruitment program.

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Certified by Kealey, Dawn in SciENcv on 2025-10-01 13:54:27

CURRENT AND PENDING (OTHER) SUPPORT INFORMATION

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person.

*NAME: Crow, Adam

*POSITION TITLE: Aviation Instructor

*ORGANIZATION AND LOCATION: Calhoun Community College, Decatur, Alabama, United States

Proposals/Active Projects

***Proposal/Active Project Title:** Collaborative Research: AVIATE (Advancing AVionics in American Technical Education), a National ATE Consortium

***Status of Support:** Pending

Proposal/Award Number:

***Source of Support:** National Science Foundation

***Primary Place of Performance:** Calhoun Community College 6250 US Hwy 31 N
Tanner, AL 35671

***Proposal/Active Project Start Date: (MM/YYYY):** 07/2026

***Proposal/Active Project End Date: (MM/YYYY):** 06/2029

***Total Anticipated Proposal/Project Amount:** \$200,000

* **Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2026	0.6
2027	1.8
2028	1.8
2029	0.6

***Overall Objectives:** • Goal 1: Develop Curriculum. In partnership with employers and industry stakeholders (including the FAA and aerospace companies), create and package avionics-focused resources such as video lectures, simulations, virtual labs, and assessment modules. Content will address troubleshooting, digital communication protocols, integrated modular avionics, fly-by-wire systems, and cybersecurity. Active learning methods will be emphasized, blending computer-based content with hands-on projects. All materials will undergo evidence-based evaluation to ensure instructional effectiveness. • Goal 2: Recruit and Deploy. Implement the curriculum across secondary, post-secondary, apprenticeship, community-based, and corporate training programs. Outreach efforts will target underserved groups, including students from rural communities, veterans, transitioning military personnel, and unemployed or underemployed populations. • Goal 3: Train and Mentor. Provide professional development for educators, including instructor guides, online workshops, and in-person training. Faculty will be paired with industry professionals to ensure accurate instruction of emerging avionics technologies and access to subject matter expertise. • Goal 4: Impact.

Establish pathways with clear destinations validated by employers and post-secondary institutions, including credit for prior learning, job and interview guarantees, and direct apprenticeship or employment opportunities.

***Statement of Potential Overlap:** None

Certification:

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I also certify that, at the time of submission, I am not a party to a malign foreign talent recruitment program.

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Certified by Crow, Adam in SciENCv on 2025-10-01 15:55:17

CURRENT AND PENDING (OTHER) SUPPORT INFORMATION

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person.

*NAME: Sasso, Michael

PERSISTENT IDENTIFIER (PID) OF THE SENIOR/KEY PERSON: <https://orcid.org/0009-0002-0294-8578>

*POSITION TITLE: Aircraft Maintenance Chief

*ORGANIZATION AND LOCATION: Aims Community College, Greeley, Colorado, United States

Proposals/Active Projects

*Proposal/Active Project Title: 2025 Aviation Education and Workforce Development Grant

*Status of Support: Current

Proposal/Award Number: 25-AIM-E02

*Source of Support: Colorado Department of Transportation

*Primary Place of Performance: Aims Community College, Greeley, CO, USA

*Proposal/Active Project Start Date: (MM/YYYY): 07/2025

*Proposal/Active Project End Date: (MM/YYYY): 06/2026

*Total Anticipated Proposal/Project Amount: \$30,350

* Person Months per budget period Devoted to the Proposal/Active Project:

Year	Person Months
2025	3
2026	3

*Overall Objectives: Aviation Maintenance Program Start up

*Statement of Potential Overlap: None

*Proposal/Active Project Title: Collaborative Research: AVIATE (Advancing AVionics in American Technical Education), a National ATE Consortium

*Status of Support: Pending

Proposal/Award Number:

***Source of Support:** National Science Foundation

***Primary Place of Performance:** Aims Community College, Greeley, CO, USA

***Proposal/Active Project Start Date: (MM/YYYY):** 07/2026

***Proposal/Active Project End Date: (MM/YYYY):** 06/2029

***Total Anticipated Proposal/Project Amount:** \$200,000

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2026	0.9
2027	0.9
2028	0.6
2029	0.3

***Overall Objectives:** Through AVIATE, the consortium will create and integrate evidence-based curricula, deploy immersive learning technologies, align programs with industry-defined competencies, and implement avionics content across participating institutions. AVIATE will strengthen avionics career pathways, expand training capacity, and ensure the U.S. maintains global leadership in aviation safety, innovation, defense readiness, and workforce development.

***Statement of Potential Overlap:** None

Certification:

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Certified by Sasso, Michael in SciENCv on 2025-10-01 12:33:06

CURRENT AND PENDING (OTHER) SUPPORT INFORMATION

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person.

*NAME: Schriber, Burton

*POSITION TITLE: Aviation Maintenance Instructor

*ORGANIZATION AND LOCATION: Aims Community College, Greeley, Colorado, United States

Proposals/Active Projects

*Proposal/Active Project Title: 2025 Aviation Education and Workforce Development Grant

*Status of Support: Current

Proposal/Award Number: 25-AIM-E02

*Source of Support: Colorado Department of Transportation

*Primary Place of Performance: Aims Community College, Greeley, CO, USA

*Proposal/Active Project Start Date: (MM/YYYY): 07/2025

*Proposal/Active Project End Date: (MM/YYYY): 06/2026

*Total Anticipated Proposal/Project Amount: \$30,350

* Person Months per budget period Devoted to the Proposal/Active Project:

Year	Person Months
2025	0.5
2026	0.5

*Overall Objectives: Aviation Maintenance Program Start up

*Statement of Potential Overlap: None

*Proposal/Active Project Title: Collaborative Research: AVIATE (Advancing AVionics in American Technical Education), a National ATE Consortium

*Status of Support: Pending

Proposal/Award Number:

***Source of Support:** National Science Foundation

***Primary Place of Performance:** Aims Community College, Greeley, CO, USA

***Proposal/Active Project Start Date: (MM/YYYY):** 07/2026

***Proposal/Active Project End Date: (MM/YYYY):** 06/2029

***Total Anticipated Proposal/Project Amount:** \$200,000

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2026	0.45
2027	0.68
2028	0.29
2029	0.05

***Overall Objectives:** Through AVIATE, the consortium will create and integrate evidence-based curricula, deploy immersive learning technologies, align programs with industry-defined competencies, and implement avionics content across participating institutions. AVIATE will strengthen avionics career pathways, expand training capacity, and ensure the U.S. maintains global leadership in aviation safety, innovation, defense readiness, and workforce development.

***Statement of Potential Overlap:** None

Certification:

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Certified by Schriber, Burton in SciENCv on 2025-10-01 13:06:26

CURRENT AND PENDING (OTHER) SUPPORT INFORMATION

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person.

*NAME: Chalil Madathil, Kapil

*POSITION TITLE: Wilfred Tiencken Professor

*ORGANIZATION AND LOCATION: Clemson University, Clemson, South Carolina, United States

Proposals/Active Projects

*Proposal/Active Project Title: Next Generation Hydrogen Technologies - DE-EE001439

*Status of Support: Current

Proposal/Award Number:

*Source of Support: Department of Energy

*Primary Place of Performance: Clemson University

*Proposal/Active Project Start Date: (MM/YYYY): 01/2025

*Proposal/Active Project End Date: (MM/YYYY): 12/2027

*Total Anticipated Proposal/Project Amount: \$2,900,000

* Person Months per budget period Devoted to the Proposal/Active Project:

Year	Person Months
2025	1.52
2026	1.52
2027	1.52

*Overall Objectives: The project will advance the technologies associated with the production, storage, transport, delivery, and utilization of hydrogen, assisting decarbonization goals of regional stakeholders, promoting economic development in the state of South Carolina, the Southeast region and the entire nation.

*Statement of Potential Overlap: None.

*Proposal/Active Project Title: Collaborative Research: Immersive Learning Technologies: Expanding Access Through Open-Source Innovation - KonnectXR (KXR)

*Status of Support: Current

Proposal/Award Number: 2024002128***Source of Support:** NSF***Primary Place of Performance:** Clemson University***Proposal/Active Project Start Date: (MM/YYYY):** 09/2024***Proposal/Active Project End Date: (MM/YYYY):** 08/2027***Total Anticipated Proposal/Project Amount:** \$1,022,772*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2025	0.46
2026	0.46
2027	0.46

***Overall Objectives:** The KonnectXR team seeks to improve technician education through accelerated integration of XR technology into technician classroom. This collaborative proposal will develop KonnectXR into an enterprise-level platform optimized for educational systems and make it available to educators across that nation.

***Statement of Potential Overlap:** NA

***Proposal/Active Project Title:** NSF RAISE: CET: Building the Fusion Future – Identifying and Bridging the Workforce Gap for the Emergent Fusion Energy Industry

Status of Support:** Current**Proposal/Award Number:** 2024000408Source of Support:** NSF thru Columbia University***Primary Place of Performance:** Clemson University***Proposal/Active Project Start Date: (MM/YYYY):** 08/2024***Proposal/Active Project End Date: (MM/YYYY):** 07/2029***Total Anticipated Proposal/Project Amount:** \$324,372*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2024	0.17
2025	0.17
2026	1

Year	Person Months
2027	1

***Overall Objectives:** Present a comprehensive education and workforce development plan to address the anticipated technician and engineering skill gap in the fusion energy industry as the nation transitions to a sustainable and clean-energy future.

***Statement of Potential Overlap:** NA

***Proposal/Active Project Title:** Minimizing the Impact of Cognitive and Physical Limitations from Humans and Autonomy Through the Development, Training, and Implementation of Human-Autonomy Teaming in Underwater Environments

***Status of Support:** Current

Proposal/Award Number: 2024000004

***Source of Support:** ONR

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 03/2024

***Proposal/Active Project End Date: (MM/YYYY):** 02/2027

***Total Anticipated Proposal/Project Amount:** \$1,095,901

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2024	1
2025	1
2026	1

***Overall Objectives:** The proposed work will make substantial contributions to the field of human-autonomy teaming and US Navy efforts. In particular, this work will create the first explicit understanding of how human-autonomy teams can consider and overcome the limitations of teammates, including an exploratory understanding of what limitations will exist, an empirical quantification of the impacts of these limitations, and a quantification of the benefits of limitation awareness to immediate and future team effectiveness.

***Statement of Potential Overlap:** NA

***Proposal/Active Project Title:** Workforce Education for Aviation Inspection and Maintenance - WE AIM: A VR/AR Hybrid Approach to Aviation Maintenance Technician General Curriculum in High School Programs

***Status of Support:** Current

Proposal/Award Number: 2024000203

***Source of Support:** FAA

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 03/2024

***Proposal/Active Project End Date: (MM/YYYY):** 03/2026

***Total Anticipated Proposal/Project Amount:** \$497,317

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2024	0.44

***Overall Objectives:** WE AIM is positioned to address the aviation industry's needs for a more qualified and diverse aviation technician workforce by deploying an aviation maintenance curriculum in high schools, providing professional development for high school teachers, creating supporting resources to ensure success, and building aviation maintenance career pipelines across the nation through its partnership network.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** Revolutionizing the Future of Aviation Maintenance: A Workforce Development Plan to Navigate the Complexities of a New Aviation Maintenance Ecosystem

***Status of Support:** Current

Proposal/Award Number: 2023002297

***Source of Support:** NASA

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 01/2024

***Proposal/Active Project End Date: (MM/YYYY):** 12/2025

***Total Anticipated Proposal/Project Amount:** \$599,996

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2024	0.99
2025	0.99

***Overall Objectives:** The long-term goal of this project is to ensure the aerospace maintenance technical workforce possesses the essential skills and knowledge required to effectively meet the demands posed by the ever-changing aerospace landscape. To that end, Revolutionizing Aviation Maintenance Ecosystems - Rev AME will create and disseminate a workforce development plan for creating qualified maintenance technicians to service, maintain, and inspect Advanced Technology Aircraft.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** Collaborative Research: Resource Collaborative for Immersive Technologies (RECITE)

***Status of Support:** Current

Proposal/Award Number: 2023001939

***Source of Support:** NSF

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 11/2023

***Proposal/Active Project End Date: (MM/YYYY):** 10/2026

***Total Anticipated Proposal/Project Amount:** \$1,454,932

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2024	1
2025	1
2026	1

***Overall Objectives:** This ATE Special Project, the REsource Collaborative for Immersive TEchnologies (RECITE), will create an innovative ecosystem that supports XR technology utilization in technician education, fosters new collaborations, develops community standards, and enhances the technician workforce pipeline to ensure U.S. industry competitiveness. RECITE will collaborate with existing and future ATE Centers and Projects to curate XR e-learning materials and amplify individual efforts.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** Collaborative Research: FW-HTF-RL: The Future of Aviation Inspection: Artificial Intelligence and Mixed Reality as Agents of Transformation

***Status of Support:** Current

Proposal/Award Number: 2023001717

***Source of Support:** NSF

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 09/2023

***Proposal/Active Project End Date: (MM/YYYY):** 08/2027

***Total Anticipated Proposal/Project Amount:** \$1,558,433

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2024	0.33
2025	0.33
2026	0.33
2027	0.33

***Overall Objectives:** The premise of this project is to sustain U.S. economic competitiveness and promote worker well-being, pervasive learning, and quality of life. The convergent interdisciplinary research will design and integrate artificial intelligence (AI) and extended reality (XR) technologies to advance fundamental understanding of the future aviation workplace and worker.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** Electric Vehicle Service Technology Certificate (EVServTech): building career pathways by implementing a hybrid curriculum in EV technology to support and diversify the next generation of EV technicians.

***Status of Support:** Current

Proposal/Award Number: 2023000522

***Source of Support:** NSF

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 06/2023

***Proposal/Active Project End Date: (MM/YYYY):** 05/2026

***Total Anticipated Proposal/Project Amount:** \$50,000

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2023	0.01
2024	0.01
2025	0.01

***Overall Objectives:** To create a career pathway for automotive technology students and professional development for instructors by developing a certificate and training resources in Electric Vehicle (EV) Service and Repair prompted by the growing demand for EV technicians in the burgeoning South Carolina Automotive industry.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** National Center for Transportation Cybersecurity and Resiliency (TraCR)

***Status of Support:** Current

Proposal/Award Number: 2023000290

***Source of Support:** US DOT

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 02/2023

***Proposal/Active Project End Date: (MM/YYYY):** 05/2029

***Total Anticipated Proposal/Project Amount:** \$4,000,000

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2023	1

***Overall Objectives:** TraCR will focus on the statutory research priority area "Reducing Transportation Cybersecurity Risks." Our members' wide array of perspectives will encompass all TCPSS cybersecurity and resiliency challenges, inclusive of all non-exclusive NOFO topic areas.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** Realizing Improved Patient Care through Human-centered Design for Pediatric mental and behavioral health in the Emergency Department

***Status of Support:** Current

Proposal/Award Number:

***Source of Support:** Agency for Healthcare Research and Quality

***Primary Place of Performance:** Clemson

***Proposal/Active Project Start Date: (MM/YYYY):** 09/2022

***Proposal/Active Project End Date: (MM/YYYY):** 09/2026

***Total Anticipated Proposal/Project Amount:** \$1,820,824

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2022	0.75
2023	0.75
2024	0.75
2025	0.75

***Overall Objectives:** The purpose of this project is to develop pediatric MBH work systems in the ED that promote safe, efficient, and effective care by minimizing unnecessary stressors for patients while also improving provider well-being.

***Statement of Potential Overlap:** None.

***Proposal/Active Project Title:** Addressing Student Skills Gaps in Water Treatment Operator Education Utilizing Virtual Reality Enabled Curriculum Resources

***Status of Support:** Current

Proposal/Award Number: 2202051

***Source of Support:** NSF

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 07/2022

***Proposal/Active Project End Date: (MM/YYYY):** 06/2025

***Total Anticipated Proposal/Project Amount:** \$299,591

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2023	0.27
2024	0.27
2025	0.27

***Overall Objectives:** Delivering water treatment operator education by designing and developing high-quality, rigorous, cost-effective, and technology-based online resources for water operator education.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** Collaborative Research: Revolutionizing Electric Vehicle Education (REVVED)

***Status of Support:** Current

Proposal/Award Number: 2202134

***Source of Support:** NSF

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 05/2022

***Proposal/Active Project End Date: (MM/YYYY):** 10/2026

***Total Anticipated Proposal/Project Amount:** \$999,893

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2023	1.09
2024	1.09
2025	1.09

***Overall Objectives:** Develop and disseminate a hybrid curriculum to improve both industry professional and student learning and promote the training of a skilled, diverse EV manufacturing and service industry technician workforce.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** CO-DREAMOER(Collaborative Development of Robotics, mEchatronics, and Advanced Manufacturing Open Educational Resources)

***Status of Support:** Current

Proposal/Award Number: 2021000789

***Source of Support:** Department of Education

***Primary Place of Performance:** Clemson SC

***Proposal/Active Project Start Date: (MM/YYYY):** 09/2021

***Proposal/Active Project End Date: (MM/YYYY):** 08/2026

***Total Anticipated Proposal/Project Amount:** \$759,629

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2022	0.37
2023	0.37
2024	0.37

***Overall Objectives:** Develop three OER robotics textbooks: Technical College: Basic and Applied Robotics in Advanced Manufacturing (250 pages) Bachelors: Foundational Robotics (300 pages) Masters: Advanced Robotics (450 pages)

***Statement of Potential Overlap:** None

***Proposal/Active Project Title:** The Center for Aviation and Automotive Technological Education using E-Learning: Providing E-learning Resources and Increasing Knowledge about Their Effectiveness

***Status of Support:** Current

Proposal/Award Number: 2020002091

***Source of Support:** National Science Foundation

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 08/2020

***Proposal/Active Project End Date: (MM/YYYY):** 07/2026

***Total Anticipated Proposal/Project Amount:** \$4,000,818

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2021	1.5
2022	1.5

Year	Person Months
2023	0.24
2024	0.24

***Overall Objectives:** The project will: 1) support aviation and automotive technological fields with a scalable, cost-effective, and flexible e-learning model; 2) grow and broaden the aviation and automotive network of scholars; 3) use e-learning to assist technical and community colleges in support of diverse communities; and 4) conduct evidence-based research and pursue longitudinal studies on the efficacy of e-learning and virtual reality/augmented reality for diverse settings.

***Statement of Potential Overlap:** None

***Proposal/Active Project Title:** Collaborative Research: America's Mobility & Manufacturing Power: Building a Next-Generation Technician Workforce for Advanced Manufacturing and the EV Supply Chain (AMP)

***Status of Support:** Pending

Proposal/Award Number: 2026000389

***Source of Support:** NSF

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 04/2026

***Proposal/Active Project End Date: (MM/YYYY):** 04/2029

***Total Anticipated Proposal/Project Amount:** \$1,000,000

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2026	0.5
2027	0.5
2028	0.5

***Overall Objectives:** AMP's mission emphasizes credential-driven workforce readiness. In partnership with SAE International and NAATBatt, the project will embed industry-recognized, standards-based credentials into hybrid curriculum pathways, ensuring learners acquire portable qualifications validated by national professional organizations. By aligning educational innovation with U.S. priorities in sustainable manufacturing, domestic supply chain resilience, and clean energy adoption, AMP strengthens the nation's capacity to lead in advanced mobility while preparing technicians for careers critical to economic growth, energy security, and global competitiveness. Through evidence-based curriculum design, rigorous evaluation, and structured faculty development, AMP will ensure educational programs remain current with emerging industry needs.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** Collaborative Research: NSF ATE:
AVIATEAdvancing AVlation and American Technical
Education: A National ATE Consortium

***Status of Support:** Pending

Proposal/Award Number: 2026000391

***Source of Support:** NSF

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 04/2026

***Proposal/Active Project End Date: (MM/YYYY):** 04/2029

***Total Anticipated Proposal/Project Amount:** \$991,069

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2026	1
2027	1
2028	1

***Overall Objectives:** We propose an innovative approach to developing and delivering avionics-focused technician education resources for aviation maintenance. We aim to achieve the following goals: Goal 1. Identify current and emerging education and workforce requirements driven by the rapid integration of advanced avionics systems, including digital flight controls, navigation, communication, and surveillance technologies, into modern aircraft. Goal 2. Design, develop and rigorously assess the developed resources in online and hybrid formats. This includes applying evidence-based evaluation methods to measure learning effectiveness and providing the resulting modules as evidence-based educational resources for the aviation maintenance community. Goal 3. Build strong national networks to recruit and retain a competitive population of avionics maintenance technician students (with a focus on veterans, rural students, and transitioning military personnel) while sharing best practices and ensuring long-term impact and sustainability across the avionics education ecosystem. Goal 4. Provide professional development for instructors and faculty leaders to implement the new avionics curricula, ensuring broad adoption, effective dissemination, and the cultivation of future principal investigators and program leaders in avionics technician education.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** Developing a Real-Time Data Analytics System for
Reducing Recreational Boating Accidents and
Fatalities

***Status of Support:** Pending

Proposal/Award Number: 2025002191

***Source of Support:** NSF thru Mercer University

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 01/2026

***Proposal/Active Project End Date: (MM/YYYY):** 12/2026

***Total Anticipated Proposal/Project Amount:** \$36,938

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2026	0.69

***Overall Objectives:** To understand the perceptions, barriers, facilitators, and motivations for adopting safe boating practices, we will conduct key informant interviews among recreational boating stakeholders. Using constructivist grounded theory, we aim to prioritize system features that enhance safe decision-making from the stakeholders' perspectives. The outcome of this aim will expand our knowledge of the demands placed on boaters, including barriers and facilitators related to safe boating practices. Upon completing Aim 1, we expect to identify the critical elements of boating decision-making and the steps that impose high cognitive and temporal demands on recreational boaters. These insights will inform the development of technology-enabled solutions to improve safety in recreational boating.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** Project STRIVE - STEM Transformation through Roofing Innovation and Virtual Engagement

***Status of Support:** Pending

Proposal/Award Number: 2026000063

***Source of Support:** NSF

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 01/2026

***Proposal/Active Project End Date: (MM/YYYY):** 12/2028

***Total Anticipated Proposal/Project Amount:** \$1,587,504

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2026	0.19
2027	0.19
2028	0.19

***Overall Objectives:** Project STRIVE will enable novel innovation and enhancement in the teaching and learning of the CET building envelope–roofing ADA-compliant curriculum for STEM undergraduates nationwide. Developing elearning modules with integrated VR/AR will catapult technology adoption in the industry and transform the landscape of CET building envelope–roofing-based education. State-of-the-art VR/AR simulations infused with artificial intelligence (AI)-based scenarios, with high-quality online lectures,

will capture the imagination of the future workforce with interactive/immersive learning and problem-solving activities as opposed to traditional delivery methods.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** Explorations (ETA-ESW DCL): The BATtery MANufacturing (BAT MAN) Project - Addressing the education and workforce needs of the evolving battery manufacturing and recycling industry

***Status of Support:** Pending

Proposal/Award Number: 2025001525

***Source of Support:** NSF

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 08/2025

***Proposal/Active Project End Date: (MM/YYYY):** 07/2028

***Total Anticipated Proposal/Project Amount:** \$999,942

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2026	0.45
2027	0.45
2028	0.45

***Overall Objectives:** The BAT MAN project is a strategic workforce development initiative that enhances America's global competitiveness by providing hands-on mentoring, career awareness programs, and immersive experiential learning opportunities to cultivate a highly skilled and innovative workforce in battery manufacturing and recycling. These initiatives will equip learners with essential skills in production, recycling, and innovation while advancing knowledge in emerging technologies such as advanced recycling methods and circular economy strategies.

***Statement of Potential Overlap:** NA

***Proposal/Active Project Title:** National Center for Transportation Cybersecurity and Resiliency (TraCR) - Year 3

***Status of Support:** Pending

Proposal/Award Number: 2025001773

***Source of Support:** Dept of Transportation

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 06/2025

***Proposal/Active Project End Date: (MM/YYYY):** 05/2026

***Total Anticipated Proposal/Project Amount:** \$3,092,491

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2025	3.25

***Overall Objectives:** TraCR will address problems based on the “transform cycle”—first identifying societal needs, then generating technological and policy innovations, and finally promoting adaptive deployment. Following the NIST cybersecurity framework, TraCR members will collaboratively develop a TCPSS hardware and software cybersecurity testbed and corresponding platform as the foundational project.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** WE AIM: A VR/AR Hybrid Approach to Aviation Maintenance Technician General Curriculum in High School Programs - YEAR 2

***Status of Support:** Pending

Proposal/Award Number: 2025001044

***Source of Support:** FAA

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 03/2025

***Proposal/Active Project End Date: (MM/YYYY):** 03/2026

***Total Anticipated Proposal/Project Amount:** \$497,317

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2025	0.35

***Overall Objectives:** Continue the deployment and dissemination of the WE AIM aviation maintenance general curriculum to 350 more students from high schools, underserved populations, and aviation maintenance technician communities.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** EmpowerRing the Future Workforce- Leveraging Technological Innovations for CET Roofing Curricula for High School

***Status of Support:** Pending

Proposal/Award Number: 2025000943

***Source of Support:** NSF

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 01/2025

***Proposal/Active Project End Date: (MM/YYYY):** 12/2027

***Total Anticipated Proposal/Project Amount:** \$1,525,608

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2025	0.25
2026	0.25
2027	0.25

***Overall Objectives:** Project RISE - primarily aims to empower the future workforce at high school by creating workforce development programs focusing on roofing.

***Statement of Potential Overlap:** NONE

Certification:

I certify that the information provided is current, accurate, and complete. This includes but is not limited to current, pending, and other support (both foreign and domestic) as defined in 42 U.S.C. § 6605.

I also certify that, at the time of submission, I am not a party to a malign foreign talent recruitment program.

Misrepresentations and/or omissions may be subject to prosecution and liability pursuant to, but not limited to, 18 U.S.C. §§ 287, 1001, 1031 and 31 U.S.C. §§ 3729-3733 and 3802.

Certified by Chalil Madathil, Kapil in SciENCv on 2025-09-25 10:30:50

CURRENT AND PENDING (OTHER) SUPPORT INFORMATION

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person.

*NAME: Gramopadhye, Anand

*POSITION TITLE: Dean, Engineering, Computing, Applied Sciences

*ORGANIZATION AND LOCATION: Clemson University, Clemson, South Carolina, United States

Proposals/Active Projects

***Proposal/Active Project Title:** Collaborative Research: Immersive Learning Technologies: Expanding Access Through Open-Source Innovation - KonnectXR (KXR)

***Status of Support:** Current

Proposal/Award Number: 2024002128

***Source of Support:** NSF

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 10/2024

***Proposal/Active Project End Date: (MM/YYYY):** 09/2027

***Total Anticipated Proposal/Project Amount:** \$1,022,772

* **Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2025	0.11
2026	0.11
2027	0.11

***Overall Objectives:** The KonnectXR team seeks to improve technician education through accelerated integration of XR technology into technician classroom. This collaborative proposal will develop KonnectXR into an enterprise-level platform optimized for educational systems and make it available to educators across that nation.

***Statement of Potential Overlap:** NA

***Proposal/Active Project Title:** NSF RAISE: CET: Building the Fusion Future – Identifying and Bridging the Workforce Gap for the Emergent Fusion Energy Industry

***Status of Support:** Current

Proposal/Award Number: 2024000408

***Source of Support:** NSF thru Columbia University

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 08/2024

***Proposal/Active Project End Date: (MM/YYYY):** 07/2029

***Total Anticipated Proposal/Project Amount:** \$324,372

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2024	0.06
2025	0.06
2026	0.06
2027	0.06

***Overall Objectives:** Present a comprehensive education and workforce development plan to address the anticipated technician and engineering skill gap in the fusion energy industry as the nation transitions to a sustainable and clean-energy future.

***Statement of Potential Overlap:** NA

***Proposal/Active Project Title:** Minimizing the Impact of Cognitive and Physical Limitations from Humans and Autonomy Through the Development, Training, and Implementation of Human-Autonomy Teaming in Underwater Environments

***Status of Support:** Current

Proposal/Award Number: 2024000004

***Source of Support:** ONR

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 03/2024

***Proposal/Active Project End Date: (MM/YYYY):** 02/2027

***Total Anticipated Proposal/Project Amount:** \$1,095,901

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2024	0.2
2025	0.2
2026	0.2

***Overall Objectives:** The proposed work will make substantial contributions to the field of human-autonomy teaming and US Navy efforts. In particular, this work will create the first explicit understanding of how human autonomy teams can consider and overcome the limitations of teammates, including an exploratory understanding of what limitations will exist, an empirical quantification of the impacts of these limitations, and a quantification of the benefits of limitation awareness to immediate and future team effectiveness.

***Statement of Potential Overlap:** NA

***Proposal/Active Project Title:** Workforce Education for Aviation Inspection and Maintenance - WE AIM: A VR/AR Hybrid Approach to Aviation Maintenance Technician General Curriculum in High School Programs

***Status of Support:** Current

Proposal/Award Number: 2024000203

***Source of Support:** FAA

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 03/2024

***Proposal/Active Project End Date: (MM/YYYY):** 03/2026

***Total Anticipated Proposal/Project Amount:** \$497,317

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2024	0.13

***Overall Objectives:** WE AIM is positioned to address the aviation industry's needs for a more qualified and diverse aviation technician workforce by deploying an aviation maintenance curriculum in high schools, providing professional development for high school teachers, creating supporting resources to ensure success, and building aviation maintenance career pipelines across the nation through its partnership network.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** Revolutionizing the Future of Aviation Maintenance:
A Workforce Development Plan to Navigate the
Complexities of a New Aviation Maintenance
Ecosystem

***Status of Support:** Current

Proposal/Award Number: 2023002297

***Source of Support:** NASA

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 01/2024

***Proposal/Active Project End Date: (MM/YYYY):** 12/2025

***Total Anticipated Proposal/Project Amount:** \$599,996

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2024	0.22
2025	0.22

***Overall Objectives:** The long-term goal of this project is to ensure the aerospace maintenance technical workforce possesses the essential skills and knowledge required to effectively meet the demands posed by the ever-changing aerospace landscape. To that end, Revolutionizing Aviation Maintenance Ecosystems - Rev AME will create and disseminate a workforce development plan for creating qualified maintenance technicians to service, maintain, and inspect Advanced Technology Aircraft.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** Collaborative Research: Resource Collaborative for
Immersive Technologies (RECITE)

***Status of Support:** Current

Proposal/Award Number: 2023001939

***Source of Support:** NSF

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 10/2023

***Proposal/Active Project End Date: (MM/YYYY):** 09/2026

***Total Anticipated Proposal/Project Amount:** \$1,454,932

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
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Year	Person Months
2024	0.1
2025	0.1
2026	0.1

***Overall Objectives:** This ATE Special Project, the REsource Collaborative for Immersive TEchnologies (RECITE), will create an innovative ecosystem that supports XR technology utilization in technician education, fosters new collaborations, develops community standards, and enhances the technician workforce pipeline to ensure U.S. industry competitiveness. RECITE will collaborate with existing and future ATE Centers and Projects to curate XR e-learning materials and amplify individual efforts.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** Collaborative Research: FW-HTF-RL: The Future of Aviation Inspection: Artificial Intelligence and Mixed Reality as Agents of Transformation

***Status of Support:** Current

Proposal/Award Number: 2023001717

***Source of Support:** NSF

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 09/2023

***Proposal/Active Project End Date: (MM/YYYY):** 08/2027

***Total Anticipated Proposal/Project Amount:** \$1,558,433

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2024	0.19
2025	0.19
2026	0.19
2027	0.19

***Overall Objectives:** The project focus is to understand how to advance the design and integration of intelligent technologies to operate in harmony with aviation maintenance technicians to support their safety goals.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** Collaborative Research: Revolutionizing Electric Vehicle Education (REVVED)

***Status of Support:** Current

Proposal/Award Number: 2022000575

***Source of Support:** NSF

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 05/2022

***Proposal/Active Project End Date: (MM/YYYY):** 10/2026

***Total Anticipated Proposal/Project Amount:** \$999,893

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2023	0.03
2024	0.03
2025	0.03

***Overall Objectives:** The REVVED project develops and disseminates a hybrid curriculum to improve industry professional and student learning, and promote the training of a skilled, diverse EV manufacturing and service industry technician workforce.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** Co-DREAM OER (Collaborative Development of Robotics Education and Advanced Manufacturing Open Educational Resources)

***Status of Support:** Current

Proposal/Award Number: 2021000789

***Source of Support:** US Dept of Education

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 09/2021

***Proposal/Active Project End Date: (MM/YYYY):** 08/2026

***Total Anticipated Proposal/Project Amount:** \$759,629

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2021	0.3

Year	Person Months
2022	0.3
2023	0.3

***Overall Objectives:** Develop 9 openly licensed textbooks, along with digital ancillary materials for these works, on robotics in advanced manufacturing for the technical college, 4-year undergraduate and the graduate levels.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** The A2 Project: The CA2VES Response to the National Need for E-learning and Capacity-Building in Aviation and Automotive Technological Education

***Status of Support:** Current

Proposal/Award Number: 2020002091

***Source of Support:** NSF

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 08/2020

***Proposal/Active Project End Date: (MM/YYYY):** 07/2026

***Total Anticipated Proposal/Project Amount:** \$4,000,018

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2020	0.5
2021	0.5
2022	0.5
2023	0.5
2024	0.5

***Overall Objectives:** To explore the advantages of integrating VR/AR technology into the education of automotive and aviation technicians, four controlled studies are proposed, focused in a logical progression on the acceptance, learning outcomes, diversity, and sustainability of the use of VR technology for A2 training in two-year colleges.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** Collaborative Research: America's Mobility & Manufacturing Power: Building a Next-Generation Technician Workforce for Advanced Manufacturing and the EV Supply Chain (AMP)

***Status of Support:** Pending

Proposal/Award Number: 2026000389

***Source of Support:** NSF

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 04/2026

***Proposal/Active Project End Date: (MM/YYYY):** 04/2029

***Total Anticipated Proposal/Project Amount:** \$1,000,000

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2026	0.25
2027	0.25
2028	0.25

***Overall Objectives:** AMP's mission emphasizes credential-driven workforce readiness. In partnership with SAE International and NAATBatt, the project will embed industry-recognized, standards-based credentials into hybrid curriculum pathways, ensuring learners acquire portable qualifications validated by national professional organizations. By aligning educational innovation with U.S. priorities in sustainable manufacturing, domestic supply chain resilience, and clean energy adoption, AMP strengthens the nation's capacity to lead in advanced mobility while preparing technicians for careers critical to economic growth, energy security, and global competitiveness. Through evidence-based curriculum design, rigorous evaluation, and structured faculty development, AMP will ensure educational programs remain current with emerging industry needs.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** Collaborative Research: NSF ATE: AVIATE- Advancing AVlation and American Technical Education: A National ATE Consortium

***Status of Support:** Pending

Proposal/Award Number: 2026000391

***Source of Support:** NSF

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 04/2026

***Proposal/Active Project End Date: (MM/YYYY):** 04/2029

***Total Anticipated Proposal/Project Amount:** \$991,069

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2026	0.1
2027	0.1
2028	0.1

***Overall Objectives:** We propose an innovative approach to developing and delivering avionics-focused technician education resources for aviation maintenance. We aim to achieve the following goals: Goal 1. Identify current and emerging education and workforce requirements driven by the rapid integration of advanced avionics systems, including digital flight controls, navigation, communication, and surveillance technologies, into modern aircraft. Goal 2. Design, develop and rigorously assess the developed resources in online and hybrid formats. This includes applying evidence-based evaluation methods to measure learning effectiveness and providing the resulting modules as evidence-based educational resources for the aviation maintenance community. Goal 3. Build strong national networks to recruit and retain a competitive population of avionics maintenance technician students (with a focus on veterans, rural students, and transitioning military personnel) while sharing best practices and ensuring long-term impact and sustainability across the avionics education ecosystem. Goal 4. Provide professional development for instructors and faculty leaders to implement the new avionics curricula, ensuring broad adoption, effective dissemination, and the cultivation of future principal investigators and program leaders in avionics technician education.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** Explorations (ETA-ESW DCL): The BATtery MANufacturing (BAT MAN) Project - Addressing the education and workforce needs of the evolving battery manufacturing and recycling industry

***Status of Support:** Pending

Proposal/Award Number: 2025001525

***Source of Support:** NSF

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 08/2025

***Proposal/Active Project End Date: (MM/YYYY):** 07/2028

***Total Anticipated Proposal/Project Amount:** \$999,942

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2026	0.13

Year	Person Months
2027	0.13
2028	0.13

***Overall Objectives:** The BAT MAN project is a strategic workforce development initiative that enhances America's global competitiveness by providing hands-on mentoring, career awareness programs, and immersive experiential learning opportunities to cultivate a highly skilled and innovative workforce in battery manufacturing and recycling. These initiatives will equip learners with essential skills in production, recycling, and innovation while advancing knowledge in emerging technologies such as advanced recycling methods and circular economy strategies.

***Statement of Potential Overlap:** NA

***Proposal/Active Project Title:** WE AIM: A VR/AR Hybrid Approach to Aviation Maintenance Technician General Curriculum in High School Programs - YEAR 2

***Status of Support:** Pending

Proposal/Award Number: 2025001044

***Source of Support:** FAA

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 03/2025

***Proposal/Active Project End Date: (MM/YYYY):** 03/2026

***Total Anticipated Proposal/Project Amount:** \$497,317

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2025	0.22

***Overall Objectives:** Continue the deployment and dissemination of the WE AIM aviation maintenance general curriculum to 350 more students from high schools, underserved populations, and aviation maintenance technician communities.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** Electric Vehicle Service Technician Training (EVServTech) Track 1: Planning and Capacity Building

***Status of Support:** Pending

Proposal/Award Number: 2024002001

***Source of Support:** DOE thru Piedmonth Tech

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 08/2024

***Proposal/Active Project End Date: (MM/YYYY):** 07/2025

***Total Anticipated Proposal/Project Amount:** \$50,000

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2025	0.01

***Overall Objectives:** Analyzing the needs and competencies required compared to existing technician education in the EV automotive service and infrastructure industry

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** Electrolyzer Manufacturing Technology Advancement

***Status of Support:** Pending

Proposal/Award Number: 2024000074

***Source of Support:** DOE thru Siemens Energy, Inc

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 01/2024

***Proposal/Active Project End Date: (MM/YYYY):** 12/2026

***Total Anticipated Proposal/Project Amount:** \$2,250,000

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2024	0.25
2025	0.25
2026	0.25

***Overall Objectives:** This project will support the advancement of PEM manufacturing technologies by SEI leading to increased capacity and capability in the United States, while supporting the achievement of stack cost target of \$100/kW. This will be accomplished by advancing the state-of-the-art through design and

automation of key manufacturing processes including catalyst paste mixing, PEM module stacking and assembly, Joining and inspection of GDL's, roll-cutting process, surface inspection, and implementing process controls – including environmental and recycling.

***Statement of Potential Overlap:** NONE

Certification:

I certify that the information provided is current, accurate, and complete. This includes but is not limited to current, pending, and other support (both foreign and domestic) as defined in 42 U.S.C. § 6605.

I also certify that, at the time of submission, I am not a party to a malign foreign talent recruitment program.

Misrepresentations and/or omissions may be subject to prosecution and liability pursuant to, but not limited to, 18 U.S.C. §§ 287, 1001, 1031 and 31 U.S.C. §§ 3729-3733 and 3802.

Certified by Gramopadhye, Anand in SciENCv on 2025-09-17 11:43:02

CURRENT AND PENDING (OTHER) SUPPORT INFORMATION

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person.

*NAME: Bertrand, Jeff

*POSITION TITLE: Director of Visualizations

*ORGANIZATION AND LOCATION: Clemson University Center for Workforce Development, Clemson, South Carolina, United States

Proposals/Active Projects

***Proposal/Active Project Title:** Collaborative Research: Immersive Learning Technologies: Expanding Access Through Open-Source Innovation - KonnectXR (KXR)

***Status of Support:** Current

Proposal/Award Number: 2024002128

***Source of Support:** NSF

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 10/2024

***Proposal/Active Project End Date: (MM/YYYY):** 09/2027

***Total Anticipated Proposal/Project Amount:** \$1,022,772

* **Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2025	3
2026	3
2027	3

***Overall Objectives:** The KonnectXR team seeks to improve technician education through accelerated integration of XR technology into technician classroom. This collaborative proposal will develop KonnectXR into an enterprise-level platform optimized for educational systems and make it available to educators across that nation.

***Statement of Potential Overlap:** NA

***Proposal/Active Project Title:** RAISE: CET: Building the Fusion Future - Identifying and Bridging the Workforce Gap for the Emergent Fusion Energy Industry

***Status of Support:** Current

Proposal/Award Number: 2024000408

***Source of Support:** NSF thru Columbia University

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 08/2024

***Proposal/Active Project End Date: (MM/YYYY):** 07/2029

***Total Anticipated Proposal/Project Amount:** \$324,372

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2026	1
2027	1

***Overall Objectives:** Present a comprehensive education and workforce development plan to address the anticipated technician and engineering skill gap in the fusion energy industry as the nation transitions to a sustainable and clean-energy future.

***Statement of Potential Overlap:** NA

***Proposal/Active Project Title:** Minimizing the Impact of Cognitive and Physical Limitations from Humans and Autonomy Through the Development, Training, and Implementation of Human-Autonomy Teaming in Underwater Environments

***Status of Support:** Current

Proposal/Award Number: 2024000004

***Source of Support:** ONR

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 03/2024

***Proposal/Active Project End Date: (MM/YYYY):** 02/2027

***Total Anticipated Proposal/Project Amount:** \$1,095,901

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
------	---------------

Year	Person Months
2024	1
2025	1
2026	1

***Overall Objectives:** The proposed work will make substantial contributions to the field of human-autonomy teaming and US Navy efforts. In particular, this work will create the first explicit understanding of how human autonomy teams can consider and overcome the limitations of teammates, including an exploratory understanding of what limitations will exist, an empirical quantification of the impacts of these limitations, and a quantification of the benefits of limitation awareness to immediate and future team effectiveness.

***Statement of Potential Overlap:** NA

***Proposal/Active Project Title:** Workforce Education for Aviation Inspection and Maintenance - WE AIM: A VR/AR Hybrid Approach to Aviation Maintenance Technician General Curriculum in High School Programs

***Status of Support:** Current

Proposal/Award Number: 2024000203

***Source of Support:** FAA

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 03/2024

***Proposal/Active Project End Date: (MM/YYYY):** 03/2026

***Total Anticipated Proposal/Project Amount:** \$497,317

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2024	3.23

***Overall Objectives:** WE AIM is positioned to address the aviation industry's needs for a more qualified and diverse aviation technician workforce by deploying an aviation maintenance curriculum in high schools, providing professional development for high school teachers, creating supporting resources to ensure success, and building aviation maintenance career pipelines across the nation through its partnership network.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** Collaborative Research: FW-HTF-RL: The Future of Aviation Inspection: Artificial Intelligence and Mixed Reality as Agents of Transformation

***Status of Support:** Current

Proposal/Award Number: 2023001717

***Source of Support:** NSF

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 09/2023

***Proposal/Active Project End Date: (MM/YYYY):** 08/2027

***Total Anticipated Proposal/Project Amount:** \$1,558,433

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2024	2
2025	2
2026	2
2027	2

***Overall Objectives:** The project focus is to understand how to advance the design and integration of intelligent technologies to operate in harmony with aviation maintenance technicians to support their safety goals.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** Collaborative Research: America's Mobility & Manufacturing Power: Building a Next-Generation Technician Workforce for Advanced Manufacturing and the EV Supply Chain (AMP)

***Status of Support:** Pending

Proposal/Award Number: 2026000389

***Source of Support:** NSF

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 04/2026

***Proposal/Active Project End Date: (MM/YYYY):** 04/2029

***Total Anticipated Proposal/Project Amount:** \$1,000,000

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2026	3
2027	3
2028	3

***Overall Objectives:** AMP's mission emphasizes credential-driven workforce readiness. In partnership with SAE International and NAATBatt, the project will embed industry-recognized, standards-based credentials into hybrid curriculum pathways, ensuring learners acquire portable qualifications validated by national professional organizations. By aligning educational innovation with U.S. priorities in sustainable manufacturing, domestic supply chain resilience, and clean energy adoption, AMP strengthens the nation's capacity to lead in advanced mobility while preparing technicians for careers critical to economic growth, energy security, and global competitiveness. Through evidence-based curriculum design, rigorous evaluation, and structured faculty development, AMP will ensure educational programs remain current with emerging industry needs.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** Collaborative Research: NSF ATE: AVIATE-
Advancing AVIation and American Technical
Education: A National ATE Consortium

***Status of Support:** Pending

Proposal/Award Number: 2026000391

***Source of Support:** NSF

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 04/2026

***Proposal/Active Project End Date: (MM/YYYY):** 03/2029

***Total Anticipated Proposal/Project Amount:** \$991,069

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2026	0.5
2027	0.5
2028	0.5

***Overall Objectives:** We propose an innovative approach to developing and delivering avionics-focused technician education resources for aviation maintenance. We aim to achieve the following goals: Goal 1. Identify current and emerging education and workforce requirements driven by the rapid integration of advanced avionics systems, including digital flight controls, navigation, communication, and surveillance technologies, into modern aircraft. Goal 2. Design, develop and rigorously assess the developed resources in online and hybrid formats. This includes applying evidence-based evaluation methods to measure learning effectiveness and providing the resulting modules as evidence-based educational resources for the aviation

maintenance community. Goal 3. Build strong national networks to recruit and retain a competitive population of avionics maintenance technician students (with a focus on veterans, rural students, and transitioning military personnel) while sharing best practices and ensuring long-term impact and sustainability across the avionics education ecosystem. Goal 4. Provide professional development for instructors and faculty leaders to implement the new avionics curricula, ensuring broad adoption, effective dissemination, and the cultivation of future principal investigators and program leaders in avionics technician education.

***Statement of Potential Overlap: NONE**

Certification:

I certify that the information provided is current, accurate, and complete. This includes but is not limited to current, pending, and other support (both foreign and domestic) as defined in 42 U.S.C. § 6605.

I also certify that, at the time of submission, I am not a party to a malign foreign talent recruitment program.

Misrepresentations and/or omissions may be subject to prosecution and liability pursuant to, but not limited to, 18 U.S.C. §§ 287, 1001, 1031 and 31 U.S.C. §§ 3729-3733 and 3802.

Certified by Bertrand, Jeff in SciENCv on 2025-09-17 11:21:49

CURRENT AND PENDING (OTHER) SUPPORT INFORMATION

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person.

*NAME: Short, Rebecca

*POSITION TITLE: Director, CUCWD

*ORGANIZATION AND LOCATION: Clemson University, Clemson, South Carolina, United States

Proposals/Active Projects

***Proposal/Active Project Title:** Workforce Education for Aviation Inspection and Maintenance - WE AIM: A VR/AR Hybrid Approach to Aviation Maintenance Technician General Curriculum in High School Programs

***Status of Support:** Current

Proposal/Award Number: 2024000203

***Source of Support:** FAA

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 03/2024

***Proposal/Active Project End Date: (MM/YYYY):** 03/2026

***Total Anticipated Proposal/Project Amount:** \$497,317

* **Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2024	2.16
2025	2.16

***Overall Objectives:** WE AIM will 1) facilitate continual improvement to the content specifically focused on refining and enhancing hands-on activities and teacher guides and resources, 2) build reporting and analysis features into the curriculum platform to ensure outcomes are achieved and to continually assess student performance in order to improve training, 3) remove barriers to adoption, 4) develop and clearly communicate pathways available to students, 5) scale and expand the program to an additional 1,000 students cross the United States through outreach and marketing, with a specific emphasis on reaching underserved communities, and 6) develop a plan to ensure long-term sustainability of the program.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** Collaborative Research: Revolutionizing Electric Vehicle Education (REVVED)

***Status of Support:** Current

Proposal/Award Number: 2022000575

***Source of Support:** NSF

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 05/2022

***Proposal/Active Project End Date: (MM/YYYY):** 10/2026

***Total Anticipated Proposal/Project Amount:** \$999,893

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2023	2
2024	2
2025	2

***Overall Objectives:** Using ELearning (CA2VES DUE#2033801 and #1501695), proposes REVVED - Revolutionizing Electric Vehicle Education: A faculty-driven consortium of two-year Institutions of Higher Education (IHEs) with institutional leadership support, NSF projects and centers, and industry collaborating to address the next generation cross-disciplinary workforce needs of the Electric Vehicle (EV) manufacturing and service industry using an innovative hybrid virtual and augmented reality (VR/AR) education approach.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** The A2 Project: The CA2VES Response to the National Need for E-learning and Capacity-Building in Aviation and Automotive Technological Education

***Status of Support:** Current

Proposal/Award Number: 2033801

***Source of Support:** NSF

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 08/2020

***Proposal/Active Project End Date: (MM/YYYY):** 07/2026

***Total Anticipated Proposal/Project Amount:** \$4,000,018

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
------	---------------

Year	Person Months
2020	4
2021	4
2022	4
2023	4

***Overall Objectives:** 1. Support A2 technological fields with a scalable, cost-effective, & flexible e-learning model. 2. Grow & broaden the A2 network community of scholars. 3. Using e-learning to assist two-year colleges in support of diverse communities. 4. Conduct evidence-based research & pursue longitudinal studies.

***Statement of Potential Overlap:** Working on related NSF project grant.

***Proposal/Active Project Title:** Collaborative Research: America's Mobility & Manufacturing Power: Building a Next-Generation Technician Workforce for Advanced Manufacturing and the EV Supply Chain (AMP)

***Status of Support:** Pending

Proposal/Award Number: 2026000389

***Source of Support:** NSF

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 04/2026

***Proposal/Active Project End Date: (MM/YYYY):** 04/2029

***Total Anticipated Proposal/Project Amount:** \$1,000,000

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2026	0.52
2027	0.52
2028	0.52

***Overall Objectives:** AMP's mission emphasizes credential-driven workforce readiness. In partnership with SAE International and NAATBatt, the project will embed industry-recognized, standards-based credentials into hybrid curriculum pathways, ensuring learners acquire portable qualifications validated by national professional organizations. By aligning educational innovation with U.S. priorities in sustainable manufacturing, domestic supply chain resilience, and clean energy adoption, AMP strengthens the nation's capacity to lead in advanced mobility while preparing technicians for careers critical to economic growth, energy security, and global competitiveness. Through evidence-based curriculum design, rigorous evaluation, and structured faculty development, AMP will ensure educational programs remain current with emerging

industry needs.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** Collaborative Research: NSF ATE:
AVIATEAdvancing AVlation and American Technical
Education: A National ATE Consortium

***Status of Support:** Pending

Proposal/Award Number: 2026000391

***Source of Support:** NSF

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 04/2026

***Proposal/Active Project End Date: (MM/YYYY):** 04/2029

***Total Anticipated Proposal/Project Amount:** \$999,999

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2026	0.1
2027	0.1
2028	0.1

***Overall Objectives:** We propose an innovative approach to developing and delivering avionics-focused technician education resources for aviation maintenance. We aim to achieve the following goals: Goal 1. Identify current and emerging education and workforce requirements driven by the rapid integration of advanced avionics systems, including digital flight controls, navigation, communication, and surveillance technologies, into modern aircraft. Goal 2. Design, develop and rigorously assess the developed resources in online and hybrid formats. This includes applying evidence-based evaluation methods to measure learning effectiveness and providing the resulting modules as evidence-based educational resources for the aviation maintenance community. Goal 3. Build strong national networks to recruit and retain a competitive population of avionics maintenance technician students (with a focus on veterans, rural students, and transitioning military personnel) while sharing best practices and ensuring long-term impact and sustainability across the avionics education ecosystem. Goal 4. Provide professional development for instructors and faculty leaders to implement the new avionics curricula, ensuring broad adoption, effective dissemination, and the cultivation of future principal investigators and program leaders in avionics technician education.

***Statement of Potential Overlap:** NA

***Proposal/Active Project Title:** NSF Engines: South Carolina Upstate Innovation
Engine

***Status of Support:** Pending

Proposal/Award Number:

***Source of Support:** NSF

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 03/2026

***Proposal/Active Project End Date: (MM/YYYY):** 02/2028

***Total Anticipated Proposal/Project Amount:** \$15,000,000

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2026	0.1
2027	0.1

***Overall Objectives:** South Carolina (SC) Upstate Innovation Engine [SCULE] Vision is to be a vibrant innovation-driven regional economy, where use-inspired research adjacent to world-class advanced manufacturing facilities become a platform for leadership in nationally essential manufacturing technologies.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** Educational and Outreach Activities Supporting Advanced Manufacturing Curriculum

***Status of Support:** Pending

Proposal/Award Number: 2025002262

***Source of Support:** SkilRedi

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 07/2025

***Proposal/Active Project End Date: (MM/YYYY):** 06/2026

***Total Anticipated Proposal/Project Amount:** \$10,490

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2026	0.18

***Overall Objectives:** Provide targeted educational support for the continued enhancement of advanced manufacturing curriculum.

***Statement of Potential Overlap:** NONE

***Proposal/Active Project Title:** WE AIM: A VR/AR Hybrid Approach to Aviation Maintenance Technician General Curriculum in High School Programs - YEAR 2

***Status of Support:** Pending

Proposal/Award Number: 2025001044

***Source of Support:** FAA

***Primary Place of Performance:** Clemson University

***Proposal/Active Project Start Date: (MM/YYYY):** 03/2025

***Proposal/Active Project End Date: (MM/YYYY):** 02/2026

***Total Anticipated Proposal/Project Amount:** \$497,317

*** Person Months per budget period Devoted to the Proposal/Active Project:**

Year	Person Months
2025	1.2

***Overall Objectives:** Continue the deployment and dissemination of the WE AIM aviation maintenance general curriculum to 350 more students from high schools, underserved populations, and aviation maintenance technician communities.

***Statement of Potential Overlap:** NONE

Certification:

I certify that the information provided is current, accurate, and complete. This includes but is not limited to current, pending, and other support (both foreign and domestic) as defined in 42 U.S.C. § 6605.

I also certify that, at the time of submission, I am not a party to a malign foreign talent recruitment program.

Misrepresentations and/or omissions may be subject to prosecution and liability pursuant to, but not limited to, 18 U.S.C. §§ 287, 1001, 1031 and 31 U.S.C. §§ 3729-3733 and 3802.

Certified by Short, Rebecca in SciENCv on 2025-09-30 15:01:35

Table 1

1	Your Name:	Your Organizational Affiliation(s), last 12 mo	Last Active Date
	Hall, James	Wichita State University Campus of Applied Sciences and Technology (WSU Tech), Wichita, KS	
		Aviation Technician Education Council (ATEC)	
		Choose Aerospace	
		National FAA Safety Team (FAASTeam)	
		Kansas State Department of Education (KSDE): Transportation Cluster Aviation Pathway Chair	04/15/25

Table 2

2	Name:	Type of Relationship	Optional (email, Department)	Last Active Date
R	N/A			

Table 3

3	Advisor/Advisee Name:	Organizational Affiliation	Optional (email, Department)
G	N/A		
T	N/A		

Table 4

4	Name:	Organizational Affiliation	Optional (email, Department)	Last Active Date
A	N/A			
C	Gifford, Michele	Textron Aviation, Wichita, KS	HR Director	
C	Istas, Jessica	Bombardier, Wichita, KS	Director Aftermarket EHS, U.S. Academia, & Community Relations	
C	Utash, Sheree Dr.	Wichita State University Campus of Applied Sciences and Technology, Wichita, KS	President	
C	Doak, Josh Dr.	Wichita State University Campus of Applied Sciences and Technology, Wichita, KS	Dean of Aviation	
C	Swortwood, Tony	Wichita State University Campus of Applied Sciences and Technology, Wichita, KS	Senior Manager of Workforce Development	
C	Hendricks, Jess	Choose Aerospace	Program Manager	

Table 5

5	Name:	Organizational Affiliation	Journal/Collection	Last Active Date
B	N/A			
E	N/A			

Table 1

1	Your Name:	Your Organizational Affiliation(s), last 12 mo	Last Active Date
	Brenwald, Aaron L	WSU Tech	

Table 2

2	Name:	Type of Relationship	Optional (email, Department)	Last Active Date
R	N/A			

Table 3

3	Advisor/Advisee Name:	Organizational Affiliation	Optional (email, Department)
G	N/A		
T	N/A		

Table 4

4	Name:	Organizational Affiliation	Optional (email, Department)	Last Active Date
A	N/A			
C	N/A			

Table 5

5	Name:	Organizational Affiliation	Journal/Collection	Last Active Date
B	N/A			
E	N/A			

Table 1

1	Your Name:	Your Organizational Affiliation(s), last 12 mo	Last Active Date
	Kealey, Dawn M	WSU Tech	

Table 2

2	Name:	Type of Relationship	Optional (email, Department)	Last Active Date
R	N/A	N/A		

Table 3

3	Advisor/Advisee Name:	Organizational Affiliation	Optional (email, Department)
G	N/A	N/A	
T	N/A	N/A	

Table 4

4	Name:	Organizational Affiliation	Optional (email, Department)	Last Active Date
A	N/A	N/A		
C	Hall, James	WSU Tech	Vice President Aviation & Workforce Development	
C	Doak, Josh Dr.	WSU Tech	Dean of Aviation	
C	Swortwood, Tony	WSU Tech	Senior Manager of Workforce Development	
C	Hendricks, Jess	WSU Tech	Program Manager	
C	Gifford, Michele	Textron Aviation	HR Director, IAT Member	
C	Istas, Jessica	Bombardier	Director Aftermarket EHS, IAT Member	
C	Kelly Filgo	Choose Aerospace	Director of Operations	

Table 5

5	Name:	Organizational Affiliation	Journal/Collection	Last Active Date
B	N/A	N/A	N/A	
E	N/A	N/A	N/A	

Table 1

1	Your Name:	Your Organizational Affiliation(s), last 12 mo	Last Active Date
	Adam Crow	Calhoun Community College	09/23/25

Table 2

2	Name:	Type of Relationship	Optional (email, Department)	Last Active Date
R	N/A			

Table 3

3	Advisor/Advisee Name:	Organizational Affiliation	Optional (email, Department)
G	N/A		
T	N/A		

Table 4

4	Name:	Organizational Affiliation	Optional (email, Department)	Last Active Date
A	N/A			
C	N/A			

Table 5

5	Name:	Organizational Affiliation	Journal/Collection	Last Active Date
B	N/A			
E	N/A			

Table 1

1	Your Name:	Your Organizational Affiliation(s), last 12 mo	Last Active Date
	Sasso Jr., Michael R.	Aims Community College	

Table 2

2	Name:	Type of Relationship	Optional (email, Department)	Last Active Date
R	None			

Table 3

3	Advisor/Advisee Name:	Organizational Affiliation	Optional (email, Department)
G	None		
T	None		

Table 4

4	Name:	Organizational Affiliation	Optional (email, Department)	Last Active Date
A	None			
C	None			

Table 5

5	Name:	Organizational Affiliation	Journal/Collection	Last Active Date
B	None			
E	None			

Table 1

1	Your Name:	Your Organizational Affiliation(s), last 12 mo	Last Active Date
	Schriber, Burton R.	Aims Community College	

Table 2

2	Name:	Type of Relationship	Optional (email, Department)	Last Active Date
R	None			

Table 3

3	Advisor/Advisee Name:	Organizational Affiliation	Optional (email, Department)
G	None		
T	None		

Table 4

4	Name:	Organizational Affiliation	Optional (email, Department)	Last Active Date
A				
C	None			

Table 5

5	Name:	Organizational Affiliation	Journal/Collection	Last Active Date
B				
E	None			

Table 1

1	Your Name:	Your Organizational Affiliation(s), last 12 mo	Last Active Date
	Chalil Madathil, Kapil	Clemson University	
		Medical University of South Carolina (Adjunct Professor)	
		Greenville Health System	

Table 2

2	Name:	Type of Relationship	Optional (email, Department)	Last Active Date
R	Martinez, Eric	Business		

Table 3

3	Advisor/Advisee Name:	Organizational Affiliation	Optional (email, Department)
G	Greenstein, Joel	Clemson University	iejsg@clemson.edu, Industrial Engineering
T	Agnisarman, Sruthy	Clemson University	sorozhi@clemson.edu, Civil Engineering
T	Khasawneh, Amro	Clemson University	akhasaw@g.clemson.edu, Industrial Engineering
T	Rogers, Hunter	Clemson University	hkroger@clemson.edu, Industrial Engineering
T	Narasimha, Shraddhaa	Clemson University	shraddn@g.clemson.edu, Industrial Engineering
T	Ponathil, Amal	Clemson University	aponath@clemson.edu, Civil Engineering
T	Lopes, Snowil	Clemson University	slopes@clemson.edu, Civil Engineering
T	Bhanu, Aashish C	Clemson University	aasishc@clemson.edu, Civil Engineering
T	Sawant, Sarvesh	Clemson University	ssarves@clemson.edu; Industrial Engineering
T	Riley, Zachary	Clemson University	zreilly@clemson.edu; Industrial Engineering
T	Upadhyay, Bhargav	Clemson University	bupadhy@g.clemson.edu; Industrial Engineering
T	Brady, Camden	Clemson University	cbrady@clemson.edu; Industrial Engineering
T	Anoop, Gayatri	Clemson University	ganoop@clemson.edu; Industrial Engineering

Table 4

4	Name:	Organizational Affiliation	Optional (email, Department)	Last Active Date
A	Ashok, Aparna	Southern Illinois University		
A	Babu, Sabarish	Clemson University		
C	Bertrand, Jeffery	Clemson University		
C	Castle, Carey	Northland Technical College		
C	Dean, Delphine	Clemson University		
A	Dye, Cheryl	Clemson University		
A	Frady, Kristin	Clemson University		

C	Gallagher, Eliza	Clemson University		
C	Gramopadhye, Anand	Clemson University		
C	Holmstedt, Christine	Medical University of South Carolina		
C	Holden, Richard	Indiana University		
C	Hartley, Rebecca	Clemson University		
C	Hegde, Sudeep	Clemson University		
C	Jia, Yunyi	Clemson University		
C	Joseph, Anjali	Clemson University		
C	Karanfil, Tanju	Clemson University		
C	Kimerling, Lionel	Massachusetts Institute of Technology		
C	Krovi, Venkat	Clemson University		
A	Martin, James	University of Pittsburgh		
C	McNeese, Nathan	Clemson University		
A	McElligott, James	Medical University of South Carolina		
C	Mehta, Ranjana	Texas A&M University		
A	Moskowitz, Jay	University of South Carolina		01/08/13
A	Neyens, David	Clemson University		
C	Narasimhan, Meera	University of South Carolina		
A	Obeid, Jihad	Medical University of South Carolina		
A	Piratla, Kalyan	Clemson University		
C	Pagilla, Prabhakar	Texas A&M University		
C	Riggs, Sara	Clemson University, University of Virginia		08/01/16
C	Saini, Sajan	Massachusetts Institute of Technology		
A	Sanderson, Iain	Duke University		01/04/15
A	Smith, Kevin	Medical University of South Carolina		06/01/16
A	Stanley, Laura	Montana State University		
A	Valdez, Rupa	University of Virginia		
C	Verlage, Erik	Massachusetts Institute of Technology		
A	Wagner, John	Clemson University		
A	Wang, Yue	Clemson University		
C	Washburn, Carl	Greenville Technical College		
C	Welch, Brandon	Medical University of South Carolina		
C	Whitlock, Laura	Clemson University		
C	Wisniewski, Pamela	University of Central Florida		
C	Wittie, Mike	Montana State University		
C	Zinzow, Heidi	Clemson University		

Table 5

5	Name:	Organizational Affiliation	Journal/Collection	Last Active Date
B	Gramopadhye, Anand	Clemson University	International Journal of Industrial Ergonomics	
B	Dempsey, Patrick	Centers for Disease Control	Applied Ergonomics	
E	Goonetilleke, Ravindra	Hongkong University of Science and Technology	International Journal of Industrial Ergonomics	
E	Chan, Alan	City University of Hongkong	International Journal of Industrial Ergonomics	
E	Maikala, Ram	Providence Healthcare	Ergonomics in Design	
E	Sasangohar, Farzan	Texas A&M University	Human Factors in Healthcare	

Table 1

1	Your Name:	Your Organizational Affiliation(s), last 12 mo	Last Active Date
	Gramopadhye, Anand	Clemson University	

Table 2

2	Name:	Type of Relationship	Optional (email, Department)	Last Active Date

Table 3

3	Advisor/Advisee Name:	Organizational Affiliation	Optional (email, Department)
G	Drury, Colin G.	SUNY Buffalo	

Table 4

4	Name:	Organizational Affiliation	Optional (email, Department)	Last Active Date
C	Bishu, Ramaratnam	University of Nebraska Lincoln		
C	Castle, Cary	Greenville Technical College		
C	Craft, Elaine	SC ATE; Al Koeller, SpaceTec		
C	Dawson, Darren	Kansas State University		
C	Dillard, Ben	Florence Darlington		
C	Duchowski, Andrew	Clemson University		
C	Ferrell, William	Clemson University		
C	Franco, Barry	Trident Tech		
C	Hilderbrand, Beverly	CARCAM		
C	Kanki, Barbara	NASA/Ames		
C	Kimbler, Delbert	Clemson University		
C	Leonard, Michael	Clemson University		
C	Marley, Robert J.	Missouri Univ. of Science and Technology		
C	Mazen, Mike	Florence Darlington		
C	Melloy, Brian	Clemson University		
C	Mital, Anil	Clemson University		
C	Wagner, John	Clemson University		
C	Walker, Ian	Clemson University		
C	Washburn, Carl	Greenville Technical College		

C	Watson, Jean	FAA		
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Table 5

5	Name:	Organizational Affiliation	Journal/Collection	Last Active Date

Table 1

1	Your Name:	Your Organizational Affiliation(s), last 12 mo	Last Active Date
	Bertrand, Jeffrey W.	Clemson University	

Table 2

2	Name:	Type of Relationship	Optional (email, Department)	Last Active Date

Table 3

3	Advisor/Advisee Name:	Organizational Affiliation	Optional (email, Department)
G	Babu, Sabarish	Clemson University	School of Computing
G	Hodges, Larry F.	Clemson University	School of Computing
G	Duchowski, Andrew	Clemson University	School of Computing
G	Joerg, Sophie	Clemson University	School of Computing
T	Bhargava, Ayush	Clemson University	School of Computing
T	Brickler, David	Clemson University	School of Computing

Table 4

4	Name:	Organizational Affiliation	Optional (email, Department)	Last Active Date
A	Agnisarman, Sruthy	Clemson University		
C	Anderson, David	St. Cloud Technical & Community College		
A	Babu, Sabarish	Clemson University		
C	Ballato, John	Clemson University		
C	Bhanu, Aasish	Clemson University		
A	Bhargava, Ayush	Clemson University		
A	Gramopadhye, Anand	Clemson University		
C	Kolangarakath, Arvind	Clemson University		
C	Kost, Alan	University of Arizona		
A	Madathil, Kapil Chalil	Clemson University		
C	McNeese, Nathan	Clemson University		
A	Narasimha, Shraddha	Clemson University		
C	Palanisamy, Juhi Shree	Clemson University		
A	Pagano, Chris	Clemson University		

A	Ponathil, Amal	Clemson University		
C	Quiney, Tammy	Clemson University		
A	Robb, Andrew	Clemson University		
A	Rogers, Hunter	Clemson University		
C	Saini, Sajan	Massachusetts Institute of Technology		
A	Scharett, Emma	Clemson University		
A	Short, Rebecca	Clemson University		
C	Stanley, Laura	Clemson University		
A	Syed, Zaker	Clemson University		
C	Todd, Andrew	Clemson University		
A	Torrence, Caitlin	Clemson University		
C	Trabookis, Zachary	Clemson University		
C	Turner, Rachel	Clemson University		
C	Upadhyay, Bhargav	Clemson University		
C	Verlage, Erik	Ohio State University		
A	Wagner, John	Clemson University		
C	Wang, Yue	Clemson University		
C	Washburn, Carl	Greenville Technical College		

Table 5

5	Name:	Organizational Affiliation	Journal/Collection	Last Active Date

Table 1

1	Your Name:	Your Organizational Affiliation(s), last 12 mo	Last Active Date
	Short, Rebecca	Clemson University	
		Carnegie Mellon University (Chief Workforce Officer)	06/30/19

Table 2

2	Name:	Type of Relationship	Optional (email, Department)	Last Active Date

Table 3

3	Advisor/Advisee Name:	Organizational Affiliation	Optional (email, Department)
G	Brown, Steven	Auburn University	Department of Political Sciences

Table 4

4	Name:	Organizational Affiliation	Optional (email, Department)	Last Active Date
A	Hudas, Greg	TARDEC		06/30/19
A	Cooper, Kevin	Indian River College		
C	Chalil Madathil, Kapil	Clemson University		
C	Gramopadhye, Anand	Clemson University		
C	Fedder, Gary	Carnegie Mellon University		06/30/19
C	Grabowski, Bob	Raytheon		06/30/19
C	Choset, Howie	Carnegie Mellon University		06/30/19
C	Clayton, David	Clemson University		
C	Bertrand, Jeffery	Clemson University		
A	Fewox, Keli	Piedmont Technical College		
C	Elliott, Robert	Trident Technical College		
C	Washburn, Carl	Greenville Technical College		

Table 5

5	Name:	Organizational Affiliation	Journal/Collection	Last Active Date

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NSF Synergistic Activities

IDENTIFYING INFORMATION:

NAME: James Hall

POSITION TITLE: Vice President Aviation & Workforce Development

PRIMARY ORGANIZATION AND LOCATION: WSU Tech, Wichita, Kansas, USA

SYNERGISTIC ACTIVITIES: The following four distinct examples demonstrate the broader impact of my professional and scholarly activities that focus on the integration and transfer of knowledge as well as its creation.

1. Youth In Aviation Task Force Leadership Led comprehensive initiative to address aviation workforce pipeline challenges by engaging K-12 students in STEM aviation pathways. Developed strategic partnerships between educational institutions, industry stakeholders, and community organizations to create sustainable youth engagement programs. This effort directly addresses national aviation workforce shortages while inspiring the next generation of aviation professionals through hands-on learning experiences and career exposure opportunities.

2. Aviation Technician Education Council (ATEC) Presidential Leadership Serving fourth year as President of ATEC, representing 100+ aviation maintenance training institutions nationwide. Spearheaded modernization of Part 147 federal regulations, establishment of Choose Aerospace national initiative, and dramatic expansion of FAA-certified aviation maintenance programs. Led policy advocacy resulting in streamlined testing protocols and regulatory frameworks that enhanced educational quality while reducing barriers to certification for underrepresented populations.

3. FAA Part 65 Regulation Development and Industry Collaboration Currently leading comprehensive overhaul of Part 65 federal regulations governing aviation maintenance technician certification. Coordinating multi-stakeholder working groups including industry representatives, educational institutions, and federal agencies to modernize certification standards. This initiative integrates emerging technologies, addresses workforce diversity goals, and ensures regulatory frameworks align with evolving industry needs while maintaining safety standards.

4. Regional Workforce Development and Industry Partnership Integration Established and maintain strategic partnerships with major aerospace manufacturers (Textron Aviation, Bombardier, Spirit AeroSystems) to align curriculum with industry needs and create direct career pipelines. Developed apprenticeship programs, customized training initiatives, and workforce development strategies that annually place 300+ graduates in high-demand aviation careers. This work demonstrates measurable economic impact while addressing critical national infrastructure workforce needs.

NSF Synergistic Activities

IDENTIFYING INFORMATION:

NAME: Aaron Brenwald

POSITION TITLE: Faculty, Avionics

PRIMARY ORGANIZATION AND LOCATION: WSU Tech, Wichita, KS
WS

List up to five distinct examples that demonstrate the broader impact of your professional and scholarly activities that focus on the integration and transfer of knowledge as well as its creation.

1. As the Instructor for the Avionics program at WSU Tech, I collaborated with Industry to complete a program revision for the Avionics Technology Program. I had found that certain courses didn't align with the outcomes and that some subjects that needed taught were not part of the curriculum. I proposed the program revisions to our Industry Advocacy Team and was met with a positive response and a motion to move ahead with the revisions to take place AY26.

NSF Synergistic Activities

IDENTIFYING INFORMATION:

NAME: Dawn Kealey

POSITION TITLE: Assistant Dean, Aviation Technologies

PRIMARY ORGANIZATION AND LOCATION: WSU Tech, Wichita, Kansas, USA

List up to five distinct examples that demonstrate the broader impact of your professional and scholarly activities that focus on the integration and transfer of knowledge as well as its creation.

1. **Industry Advocate Teams (IATs) Leadership and Workforce Pipeline Development**
Since 2014, led collaboration between industry and academia to align aviation maintenance curriculum with workforce needs, improving graduate employment and addressing national shortages.
2. **Choose Aerospace National Curriculum Development and Co-Principal Investigator Role**
As Co-Principal Investigator for the congressionally funded Choose Aerospace initiative, contributed to creating a standardized national high school aviation maintenance curriculum. Authored four key modules—Weight and Balance, Physics for Aviation, Materials, and Hand Tools and Measuring Devices—complete with labs, worksheets, and instructor guides. This work supports seamless transitions from K-12 to post-secondary aviation careers on a national scale.
3. **Aviation Maintenance Technology Program Innovation and Curriculum Leadership**
Led four major curriculum rewrites and program transformations between 2004 and 2023, collaborating closely with industry, regulators, and educators. These efforts ensure regulatory compliance and high educational standards, serving as a model for other institutions.
4. **Professional Organization Engagement and Women in Aviation Advocacy**
Maintain leadership roles in Aviation Technician Education Council (ATEC), Women in Aviation International (WAI), and Association for Women in Aviation Maintenance (AWAM). Promote diversity, best practices, and aviation maintenance education through national knowledge sharing. Advocate for underrepresented groups, contribute to policy and standards development, and support professional growth for thousands of aviation professionals.
5. **Educational Excellence and Student Success Mentorship Programs**
Develop and implement student success initiatives beyond classroom instruction, including mentorship for competitions, career guidance, and professional development. Recognized with awards such as Teaching Excellence (2017), SkillsUSA Advisor of the Year (2021), and multiple FAA Charles Taylor Diamond Awards. These efforts have led to improved student competition results, employment outcomes, career advancement, and enhanced representation of women in aviation maintenance.

NSF Synergistic Activities

IDENTIFYING INFORMATION: AVIATE NSF ATE

NAME: Adam Crow

POSITION TITLE: Aviation Maintenance Instructor

PRIMARY ORGANIZATION AND LOCATION: Calhoun Community College, Decatur, AL

List up to five distinct examples that demonstrate the broader impact of your professional and scholarly activities that focus on the integration and transfer of knowledge as well as its creation.

1. Calhoun Community College, Decatur, AL, United States
Currently serving as lead program developer for Calhoun Community College's inaugural Federal Aviation Administration (FAA) Part 147 Aviation Maintenance Technology program. This comprehensive initiative involves designing laboratory-based learning modules, establishing industry partnerships, and creating assessment protocols that meet stringent FAA certification requirements for Airframe and Powerplant (A&P) mechanic training. The program addresses critical workforce shortages in Alabama's aerospace sector while providing underserved rural students with direct pathways to high-demand aviation careers.
2. North Alabama Air-Fest, Decatur, AL, United States
This role involves coordinating outreach efforts to potential sponsors, facilitating networking opportunities between aviation professionals and educational institutions, and leveraging the airshow platform to showcase career pathways in aviation maintenance and aerospace manufacturing. Through these volunteer activities, I help bridge the gap between industry needs and educational opportunities while supporting community engagement.
3. Blue Origin, Huntsville, AL, United States
Lead Integration Engineer for the BE-3U Thrust Chamber Assembly at Blue Origin, I spearheaded critical manufacturing process optimization and workflow enhancement initiatives. My responsibilities encompassed analyzing complex manufacturing sequences, identifying bottlenecks in production workflows, and implementing systematic improvements to increase efficiency, reduce cycle times, and enhance quality control measures. This position required close collaboration with cross-functional teams including design engineers, quality assurance specialists, and production personnel to streamline assembly processes while maintaining the stringent safety and performance standards essential for human-rated spaceflight systems.
4. Certified Aviation Services, Fairhope, AL, United States
Capabilities Manager and Supervisor for an FAA Part 145 certified repair station, I oversaw comprehensive maintenance and overhaul operations for critical aircraft systems components, specializing in pneumatic, hydraulic, and electromechanical assemblies. This position required managing technical teams responsible for troubleshooting, repairing, and certifying complex aircraft components to stringent airworthiness standards while ensuring full compliance with FAA regulations and manufacturer specifications. My responsibilities encompassed maintaining repair procedures, supervising repair processes, coordinating assigned duties, and implementing continuous improvement initiatives. Through this role, I gained extensive experience in regulatory compliance, technical supervision, contract bidding and process development.

NSF Synergistic Activities

IDENTIFYING INFORMATION: Aims Community College

NAME: Michael Sasso

POSITION TITLE: Aviation Maintenance Chief

PRIMARY ORGANIZATION AND LOCATION: Aims Community College, Greeley, Colorado, United States of America

1. Aviation Maintenance Certification Training and Certification Testing Administrator, designing and implementing AMT programs nationwide and locally to prepare future aviation technicians for employment.
2. Aviation Maintenance Certification testing as an FAA Designated Maintenance Examiner being a crucial part of the certification process. As an authorized individual who administers the oral and practical exams required for obtaining an FAA Airframe and Powerplant (A&P) certification, I provide oversight of these essential tests, while ensuring that prospective mechanics possess the necessary knowledge and hands-on skills to safely maintain and repair aircraft, upholding high industry standards and ensuring public safety.
3. Executive Board Member of Aviation Technical Education Council which was founded in 1961 with its mission to promote and support aviation maintenance technician education, with the ultimate goal of enabling the aerospace community to meet its workforce needs. While being a part of this council leadership, I am actively engaged with regulatory bodies to support an infrastructure that will create high quality technicians, provide resources, continuing education and networking opportunities to learning institutions, keeps the community informed of activities that impact technician education, and promotes careers in aviation maintenance.
4. Member of the Aircraft Electronics Association, founded in 1957, representing nearly 1,300 member companies in more than 40 countries, including approved maintenance organizations specializing in maintenance, repair and installation of aircraft electronics systems in general aviation aircraft.
5. Aviation Maintenance Instructor – Instructing and teaching the current Airman Certification Training requirements within a FAA Part 147 training program with a focus on student outcomes while teaching students the necessary theoretical knowledge and practical skills to maintain, inspect, and repair aircraft, ensuring they are prepared for the aviation industry which includes developing and delivering lessons on aircraft systems, safety protocols, and regulations; conducting hands-on training in tool usage and maintenance procedures; evaluating student performance; and staying current with industry advancements.

NSF Synergistic Activities

IDENTIFYING INFORMATION: Aims Community College

NAME: Burton Schriber

POSITION TITLE: Aviation Maintenance Instructor

PRIMARY ORGANIZATION AND LOCATION: Aims Community College, Greeley, Colorado, United States of America

List up to five distinct examples that demonstrate the broader impact of your professional and scholarly activities that focus on the integration and transfer of knowledge as well as its creation.

1. Aviation Maintenance Instructor – Instructing and teaching the current Airman Certification Training requirements within a FAA Part 147 training program with a focus on student outcomes while teaching students the necessary theoretical knowledge and practical skills to maintain, inspect, and repair aircraft, ensuring they are prepared for the aviation industry which includes developing and delivering lessons on aircraft systems, safety protocols, and regulations; conducting hands-on training in tool usage and maintenance procedures; evaluating student performance; and staying current with industry advancements.
2. Aviation Maintenance Inspection Authorization holding this special credential issued by the Federal Aviation Administration (FAA) that allows a mechanic to perform and approve annual inspections and major repairs or alterations on aircraft. To obtain an IA, a mechanic must hold an Airframe and Powerplant (A&P) certificate for at least three years, have actively worked on aircraft for two of those years, and pass a difficult written exam on the specific requirements for inspecting and returning aircraft to service. Maintaining the IA requires completing annual training or performing specific maintenance activities, demonstrating ongoing proficiency and commitment to air safety.
3. Private Aircraft Pilot with 50 years of experience accumulating a half-century of flying time since my first solo flight, who has been recently nominated and now eligible to receive the prestigious Wright Flyer Award.
4. Member of Aviation Technical Education Council which was founded in 1961 with its mission to promote and support aviation maintenance technician education, with the ultimate goal of enabling the aerospace community to meet its workforce needs. community informed of activities that impact technician education, and promotes careers in aviation maintenance.
5. FCC License holder with current government-issued authorization from the U.S. Federal Communications Commission (FCC) that permits individuals or entities to operate specific radio communications equipment and use designated radio frequencies legally.

Kapil Chalil Madathil- Synergistic Activities

1. Education: I am responsible for teaching the following courses: Accident Analytics & Construction Safety (2019 - present), Design of Human-Computer Systems (2019 - present), and Introduction to Human Factors Engineering (2015 - 2020).
2. Innovations in Teaching and Training: Created 1,215 online learning modules, utilized by 15,000 students and incumbent workers.
3. Mentoring: Mentored 5 Ph.D. and 4 MS students; mentored 4 undergraduate students.
4. Service: Associate Editor-in-Chief, International Journal of Industrial Ergonomics, 2019 – present; Board Member, Applied Ergonomics, 2018 - present; Associate Editor, Ergonomics in Design, 2018 - present; Associate Editor, Human Factors in Healthcare, 2021 – present.

Anand K Gramopadhye - Synergistic Activities

1. Chair, Computer Systems Technical Group, Human Factors and Ergonomics Society, 2019-present.
2. Chair, Engineering Dean's Institute, Meeting focused on Grand Challenges and Diversity, Kiawah, South Carolina, 2015.
3. Scientific Advisory Board, AHFE Human Factors of Healthcare, 2015-16.
4. NSF Congressional Hearings: Broadening Participation in STEM Gramopadhye's address to members of the US Congress, Capitol Hill, Washington D.C., March 2020.
5. National Science Board, The Skilled Technical Workforce: Crafting America's Science and Engineering Enterprise, Power of Partnerships. September 2019.
[<https://newsstand.clemson.edu/mediarelations/clemson-university-cited-in-national-report-thatfocuses-on-crafting-americas-science-and-engineering-enterprise/>]

Jeff Bertrand
Fall 2025

Synergistic Activities

1. Industrial Base Analysis and Sustainment program IBAS – Develop online training simulations for bridging the gap between technicians and engineers in manufacturing.
2. Revolutionizing Electric Vehicle Education REVVED – Created online training simulations for technicians working on electric vehicles.
3. Educate Workforce Online Module Development - Developed online virtual training modules for technical college curriculum (aircraft maintenance, robotics, metrology, electrical instruments, machining and manufacturing safety protocols); performed usability evaluations to determine effectiveness and efficiency of training.
4. Virtual Manufacturing Lab: Integrated Photonics Module Development - Developed online virtual training for educational material related to integrated photonics; created interactable machines for manufacturing preforms for use in fiber optic cables.
5. Remotely Operated Underwater Vehicle - Developed a game-based simulation to allow students to practice piloting an ROV.

Rebecca Short - Synergistic Activities:

Managed development and assessment of innovative online educational material and integration of visualization tools.

Supported the ARM Institute management team in the development of the vision, mission, strategy, and values that guided the creation of the Institute. Lead the effort to customize new robotics programs and educational materials to meet the needs of the RRICs and ARM partners. Responsible for planning and coordinating the training, internships, and certification programs across the Institute.

DATA MANAGEMENT PLAN

Collaborative Research: AVIATE Advancing AVionics in American Technical Education, A National ATE Consortium

Types of Data: The AVIATE project will generate multiple forms of data in adherence to the regulations mandated by the Institutional Review Board that reflect both participant inputs and educational resources. Quantitative data will include demographic information, user interaction logs, platform analytics, performance metrics (e.g., task completion time, accuracy, assessment scores), and responses to pre- and post-activity surveys. Project partners will collect qualitative data through interviews, focus groups, project meeting notes, and participant feedback during curriculum development and pilot testing. The project's digital artifacts will include 3D simulations, XR modules, videos, open-access e-textbooks, professional development resources, course modules, and evaluation tools. Administrative and process data will include documentation of project activities, iterative refinement notes, evaluation reports, and best practice guidelines. Finally, CA²VES will disseminate data in an online repository hosted on the learning management system, including metadata, adoption records, and usage analytics. Together, these diverse data sources will inform curriculum refinement, guide best practices in avionics technician education, and provide openly accessible instructional resources to the broader technician education community.

Data and Metadata Standards: Project data will be maintained in widely accepted, non-proprietary formats to ensure accessibility and long-term usability. Standard file formats will include spreadsheets (.XLS, .CSV), documents (.DOCX, .PDF, .TXT), and media files (.AVI, .MP4) for instructional videos and demonstrations. Three-dimensional CAD files (.3DS) will be converted to Unity3D-compatible formats (.IGES, .OBJ, .DAE) for XR module development. Survey data will be stored as tab-delimited files to enable compatibility with common spreadsheet and statistical software, creating a structured database of participant responses. CA²VES will store all avionics learning modules on a customized subsite within the learning management system (LMS).

The external evaluator will archive interview and focus group data as coded transcripts in text and Word document formats, accompanied by researcher memos and notes using constant comparative methods. Demographic data will be summarized in aggregate tables to preserve confidentiality while supporting analysis of participant representation. Learning analytics the LMS generates (e.g., time on task, module completion, assessment outcomes) will be stored in an encrypted, access-controlled database hosted at NSF ATE CA²VES. Additional data from e-surveys, focus groups, and faculty/student evaluations will be curated to assess the effectiveness of XR- and simulation-based avionics training materials. All digital resources and supporting data will be cataloged with descriptive metadata (e.g., title, author, date, format, keywords) to facilitate discoverability and long-term archiving. Project outcomes, including learning modules, instructional resources, and evaluation findings, will be disseminated through the EducateWorkforce platform and made broadly accessible via ATE Central and SkillsCommons.

Sensitive or proprietary data, such as raw participant responses, individual demographic records, or identifiable interview transcripts, will not be made publicly available. Instead, such data will be securely stored on institutional servers and only de-identified, aggregated results will be disseminated. This approach will safeguard participant confidentiality while ensuring that all educational materials, findings, and best practices are broadly shared for community benefit.

Policies for Access and Sharing and Provisions for Appropriate Protection and Privacy: All project data will be securely stored on password-protected computers and institutional servers, with printed and physical records (including consent forms) maintained in locked cabinets or on encrypted hard drives in the offices of the PI or institutional leads. Access to raw data will be restricted to the PI, Co-PIs, institutional avionics faculty, institutional research staff, and approved graduate research assistants directly involved in the project, in accordance with institutional protocols. To safeguard participant privacy, all human-subject data will be de-identified prior to coding and statistical analysis; each record will be assigned an anonymized participant ID, and only anonymized data will be used in reporting or dissemination. Identifiable information will never be shared outside the research team. De-identified, non-confidential, and non-proprietary data may be made available to qualified researchers following publication through written request to the PI, ensuring compliance

with IRB and participant protections. Aggregated results and de-identified findings will be shared broadly through publications, presentations, and dissemination to two-year college partners, industry collaborators, secondary educators, and workforce development organizations. Educational resources and digital learning materials developed through this project will be openly shared through EducateWorkforce, ATE Central, and SkillsCommons to ensure broad accessibility and long-term reuse, while preserving authorship and attribution rights of the creators. Content on EducateWorkforce will be seamlessly integrated into any learning management system (including Canvas, Brightspace, Blackboard, and Moodle) through DLTI standards, enabling all partner institutions to use the content while also supporting a FERPA-compliant, central, de-identified platform for analytics and iterative refinement of digital learning tools. Any additional use of project data beyond published or archived outputs will require written permission from Mr. James Hall, PI of the AVIATE project.

Policies and Provisions for Re-use and Re-distribution: AVIATE project data will be available to all collaborating investigators, participating institutions of higher education, and the NSF ATE Centers for purposes directly related to project implementation and evaluation. Any use of data or materials beyond the original project partners will be considered on a case-by-case basis and must be approved by the investigators to ensure compliance with privacy and ethical standards. For independent research, proper attribution will be required through citation of the originating dataset and investigators. Redistribution of de-identified raw datasets will be limited and granted only with explicit written permission from the authors. All project data will be retained for a minimum of three years following the conclusion of the award in accordance with federal and institutional requirements. Data linked to individual students will remain strictly confidential and will not be released publicly under any circumstances. Only aggregate or de-identified information regarding student, faculty, or worker outcomes (such as enrollment, program completion, grades, or post-program employment statistics) will be shared when reporting program results, ensuring that individual privacy and confidentiality are fully protected. Reusable instructional resources, including avionics learning modules will be disseminated through the EducateWorkforce platform and archived with ATE Central and SkillsCommons to ensure broad accessibility, long-term preservation, and sustained availability for the national advanced technological education community.

Plans for Archiving and Preservation of Access: All project data will be stored securely on institutional servers, in PI/lead offices, or in research labs with access limited to the PI, Co-PIs, and approved team members. Deidentified raw participant data (e.g., surveys, interviews, demographics, LMS logs) will be retained for at least three years beyond the award's conclusion, then securely destroyed following institutional protocols. During this retention period, data will be encrypted and, when appropriate, backed up on institutional servers. Reusable educational products (including avionics modules, XR simulations, videos, e-textbooks, professional development resources, and evaluation reports) will be archived indefinitely on EducateWorkforce, with long-term preservation through ATE Central and SkillsCommons to ensure broad access and sustained impact. Metadata will follow Dublin Core standards (title, author, date, subject, format, keywords) for ATE Central and IMS/SCORM standards for LMS-hosted modules to ensure discoverability and reuse. If the PI departs before project completion, stewardship will transfer to institutional lead. This approach ensures secure short-term retention of sensitive data and indefinite preservation of educational products, fully aligning with NSF's Public Access Policy.

Dissemination of Data: The PIs will disseminate results broadly to the engineering and technical education community through presentations at professional conferences, including the NSF ATE Principal Investigators' conference, HI-TEC, ASEE, and discipline-specific meetings, as well as workshops and webinars for two-year colleges, secondary educators, and industry partners. Peer-reviewed publications will target leading outlets such as the *Journal Of Advanced Technological Education*, *Community College Journal Of Research And Practice*, *IEEE Transactions On Learning Technologies*, and venues supported by the American Association Of Community Colleges. Project deliverables and findings will also be shared through EducateWorkforce, ATE Central, and SkillsCommons to ensure accessibility and long-term availability. Final outcomes will be published and archived to support impact, replication, and adoption across the national advanced technological education community.

Mentoring Plan for AVIATE Participants

The **AVIATE Project** aims to develop a highly skilled workforce in the avionics industry by integrating intentional, structured mentoring to foster professional identity, enhance career readiness, and support long-term success. Mentoring will provide role models, strengthen STEM identity, and facilitate integration into emerging technology careers. This plan outlines key mentoring activities designed to support participants at all stages of their training and career development.

1. Orientation - Each participant will begin with a structured orientation session to establish a clear framework for the mentoring relationship. This session will:

- Define goals and expectations for both mentors and mentees.
- Establish guidelines for communication frequency, confidentiality, and conflict resolution.
- Provide an overview of career pathways, introducing participants to industry trends and workforce needs.
- Pair participants with mentors from academia, industry, and professional organizations.

2. Individual Development Plan (IDP) - Each participant will develop an Individual Development Plan (IDP) with their mentor to set goals, track progress, and plan for post-program opportunities. The IDP will:

- Identify short-term and long-term career goals aligned with industry needs.
- Outline key technical and professional development opportunities, and industry certifications.
- Provide structured time for reflection and career planning, enabling progress and goals assessment.
- Guide participants in developing a next-step strategy for career placement.

3. Competencies for a Successful Career - Mentoring will focus on building seven core competencies:

- Communication: Develop professional communication skills for technical and collaborative work.
- Career and Self-Development: Provide guidance on career exploration and job application strategies.
- Critical Thinking: Encourage problem-solving through experiential learning and case studies.
- Leadership: Foster leadership potential by involvement in team projects and mentorship opportunities.
- Professionalism: Reinforce workplace ethics, accountability, and industry expectations.
- Teamwork: Support collaborative projects that simulate real-world technical work environments.
- Technology: Provide exposure to cutting-edge technologies and digital learning tools.

4. Networking - Connect participants with a broad professional network to facilitate career advancement.

- Industry meetups and career fairs featuring representatives from avionics industry.
- Professional association events where participants can engage with experts.
- On-site and virtual visits to manufacturing and research facilities, providing direct exposure.
- Alumni networking and peer mentorship, ensuring continued support beyond the AVIATE program.

5. One-on-One Meetings - Each participant will meet regularly with their mentor to:

- Gather feedback on progress and discuss challenges.
- Seek advice on career development, skill-building, and professional growth.
- Review and update Individual Development Plans (IDPs) based on evolving career goals.
- Provide support for career transitions, including resume reviews, interview preparation, and job placement assistance.

6. Sustained Mentorship Beyond the Program - Mentorship will extend beyond AVIATE participation to support continued career development. Participants will have access to:

- Long-term mentorship opportunities through an industry-aligned alumni network.
- Career planning workshops that offer guidance on job market trends and future training options.
- Ongoing engagement with professional mentors and peer networks, fostering long-term career support.

The AVIATE Mentoring Plan is designed to provide structured, intentional, and meaningful mentoring that strengthens STEM identity, fosters professional growth, and prepares participants for success in avionics. By integrating orientation, individualized career planning, core competency development, networking opportunities, and ongoing mentorship, the program will create a sustainable pipeline of skilled professionals in this critical industry.

September 9, 2025

National Science Foundation
Directorate for STEM Education
Division of Undergraduate Education
2415 Eisenhower Avenue
Alexandria, VA 22314

RE: Collaborative Research: AVIATE: Advancing AVionics in American Technical Education, a National ATE Consortium - Addressing the education and workforce needs of the evolving aviation maintenance industry.

Dear Program Officer:

As a collaborating institution, Clemson University is confident that the AVIATE consortium will significantly advance technician education in aviation and aerospace sectors, while addressing critical workforce needs at both regional and national levels. This initiative reflects our shared focus on addressing the pressing workforce needs in aviation maintenance by advancing innovative approaches to technical education through virtual labs, experiential learning, and evidence-based curriculum aligned with industry demand.

The Clemson University leadership strongly supports the proposal led by Wichita State University Campus of Applied Sciences and Technology (WSU Tech), in collaboration with Choose Aerospace, Calhoun Community College, and Aims Community College. As a research-intensive, four-year institution, Clemson University is committed to contributing its expertise to strengthen the project's outcomes and advance the goals of the NSF Advanced Technological Education (ATE) program. Clemson researchers will provide workforce research and evaluation expertise, pilot curriculum integration through the Clemson University Center for Workforce Development, support faculty professional development, and mentor the next generation of ATE PIs. Our team will work closely with WSU Tech, the Aviation Technician Education Council (ATEC), Choose Aerospace, and the NSF ATE Center for Aviation and Automotive Technological Education Using Virtual E-Schools to ensure the success, sustainability, and scalability of this important national consortium.

If the proposal submitted by WSU Tech entitled **"Collaborative Research: AVIATE: Advancing AVionics in American Technical Education, a National ATE Consortium"** is selected for funding by NSF, it is my intent to collaborate and/or commit resources as detailed in the Project Description or the Facilities, Equipment and Other Resources section of the proposal.

Sincerely,



Tanju Karanfil

Senior Vice President for Research, Scholarship and Creative Endeavors

TANJU KARANFIL, Ph.D., PE, BCEE
Senior Vice President for Research, Scholarship and Creative Endeavors
Clemson University | Division of Research
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864-656-7701 | vpr@clemson.edu



September 15, 2025

National Science Foundation
Directorate for STEM Education
Division of Undergraduate Education
2415 Eisenhower Avenue
Alexandria, VA 22314

RE: Collaborative Research: AVIATE: advancing AVionics in American Technical Education, a national ATE consortium - Addressing the education and workforce needs of the evolving aviation maintenance industry.

Dear Program Officer:

On behalf of Aims Community College we are proud to express our commitment to the proposed avionics project. This initiative reflects our shared focus on addressing the pressing workforce needs in aviation maintenance by advancing innovative approaches to technical education through virtual labs and experiential learning. We are excited to further strengthen our collaboration with Wichita State University Campus of Applied Sciences and Technology (WSU Tech), Aviation Technician Education Council (ATEC), Choose Aerospace, and the NSF ATE Center for Aviation and Automotive Technological Education Using Virtual E-Schools. The project leverages cutting-edge educational technologies to create an evidence-based curriculum defined by industry needs to prepare the avionics workforce.

The new Aircraft Maintenance Training Center (AMTC) located at Northern Colorado Regional Airport, features an Airframe & Powerplant technician program with two hangars, classrooms, avionics and electronics, composite, and sheet metal labs supporting Aims' role in regional STEM and technical workforce pipelines. With established aviation programs, broad enrollment, and campus infrastructure, this uniquely positions Aims as a regional and national leader in aviation education. This expansion into maintenance and avionics, backed by physical infrastructure, institutional support, and workforce alignment, positions Aims to advance the consortium's objectives in preparing the next generation of avionic technicians.

Our engagement with the team will include the following: 1) Assisting in the identification of knowledge, skills, and abilities (KSA) gaps critical to industry success; 2) Participating in curriculum design and offering feedback to ensure alignment with industry requirements; 3) Piloting the curriculum.

If the proposal submitted by WSU Tech entitled "**Collaborative Research: AVIATE: advancing AVionics in American Technical Education, a national ATE consortium**" is selected for funding by NSF, it is my intent to collaborate and/or commit resources as detailed in the Project Description or the Facilities, Equipment and Other Resources section of the proposal.

Sincerely,


Leah Bornstein (Sep 16, 2025 09:44:58 MDT)

Leah L. Bornstein
CEO/President, Aims Community College



CALHOUN COMMUNITY COLLEGE
OFFICE OF THE PRESIDENT

September 8, 2025

National Science Foundation
Directorate for STEM Education
Division of Undergraduate Education
2415 Eisenhower Avenue
Alexandria, VA 22314

RE: Collaborative Research: AVIATE: advancing AVionics in American Technical Education, a national ATE consortium - Addressing the education and workforce needs of the evolving aviation maintenance industry.

Dear Program Officer:

On behalf of Calhoun Community College, we are proud to express our commitment to the proposed avionics project. This initiative reflects our shared focus on addressing the pressing workforce needs in aviation maintenance by advancing innovative approaches to technical education through virtual labs and experiential learning. We are excited to further strengthen our collaboration with Wichita State University Campus of Applied Sciences and Technology (WSU Tech), Aviation Technician Education Council (ATEC), Choose Aerospace, and the NSF ATE Center for Aviation and Automotive Technological Education Using Virtual E-Schools. The project leverages cutting-edge educational technologies to create an evidence-based curriculum defined by industry needs to prepare the avionics workforce. Calhoun Community College, the largest two-year institution in Alabama, serves more than 9,000 students annually across its Decatur and Huntsville campuses, with strong programs in aerospace, advanced manufacturing, and engineering technologies. With extensive experience managing federal and state workforce development grants and deep partnerships with regional employers and high school technical centers, Calhoun is well-positioned to contribute to the success of the AVIATE consortium.

Our engagement with the team will include the following: 1) Assisting in the identification of knowledge, skills, and abilities (KSA) gaps critical to industry success; 2) Participating in curriculum design and offering feedback to ensure alignment with industry requirements; 3) Piloting the curriculum.

If the proposal submitted by WSU Tech entitled "**Collaborative Research: AVIATE: advancing AVionics in American Technical Education, a national ATE consortium**" is selected for funding by NSF, it is my intent to collaborate and/or commit resources as detailed in the Project Description or the Facilities, Equipment and Other Resources section of the proposal.

Sincerely,

A handwritten signature in black ink, appearing to read "Jimmy Hodges".

Dr. Jimmy Hodges, President



Aircraft Electronics Association
3570 NE Ralph Powell Road
Lee's Summit, MO 64064
Phone: 816-347-8400
AEA.net

9/29/2025

Dear Program Officer:

On behalf of the Aircraft Electronics Association (AEA), we are proud to express our commitment for Project AVIATE to develop and implement a nationally scalable avionics-focused curriculum for deployment in secondary and post-secondary programs. As a stakeholder in the aerospace and aviation ecosystem, we recognize the urgent and growing workforce crisis facing our industry and fully endorse this initiative as a timely, innovative, and necessary solution.

The aerospace sector is experiencing a critical shortage of skilled technicians. This challenge is especially acute in avionics, where expertise in aircraft electronics, navigation, communication, and surveillance systems is in high demand. These skills are vital for supporting the safe operation and modernization of increasingly complex aircraft.

The AEA represents more than 900 FAA Part 145 repair stations across the United States. These are independent avionics shops, often serving general aviation and business aviation operators, where the shortage of trained technicians directly impacts aircraft safety, turnaround times, and operational readiness. This makes the development of a national curriculum through Project AVIATE essential to creating consistent, high-quality training that connects education programs with real workforce needs.

Project AVIATE will help address this gap by:

- Building an avionics-specific pathway that high school and college programs can adopt nationally.
- Creating direct links between schools and local repair stations so students clearly see aviation careers as accessible and attainable.

Our contribution to the project will include: 1) advising on curriculum design and confirming alignment with employer needs; 2) mentoring teachers and supporting programs in our geographical areas to ensure success; 3) building defined destinations for students to ensure training leads directly to employment opportunities; and 4) offering validation of the program through assessment of workforce outcomes.

If the project proposal is selected for funding by NSF, it is this organization's intent to collaborate and/or commit resources as necessary to carry out these objectives.

Sincerely,

Nicholas E Brown

Nick Brown
Director of Workforce Development
Aircraft Electronics Association



September 30, 2025

National Science Foundation
Directorate for STEM Education
Division of Undergraduate Education
2415 Eisenhower Avenue
Alexandria, VA 22314

Re: AVIATE: Advancing AVIonics in American Technical Education, a National ATE Consortium

Dear Program Officer:

The Aviation Technician Education Council (ATEC) is eager to collaborate with the project team to advance aviation technician education, with a particular focus on avionics in aerospace. This initiative aligns closely with ATEC's mission and furthers our commitment to ensuring a qualified aviation maintenance workforce that can meet the growing national and industry demand for highly skilled technicians.

As the national voice for aviation technician education, ATEC represents a broad network of FAA-certificated educational institutions that provide the training required for mechanic certification, along with industry partners and stakeholders committed to modernizing education and expanding access to high-quality training opportunities. ATEC is dedicated to leveraging its expertise, leadership, and national reach to strengthen the consortium's outcomes and advance the goals of this important initiative.

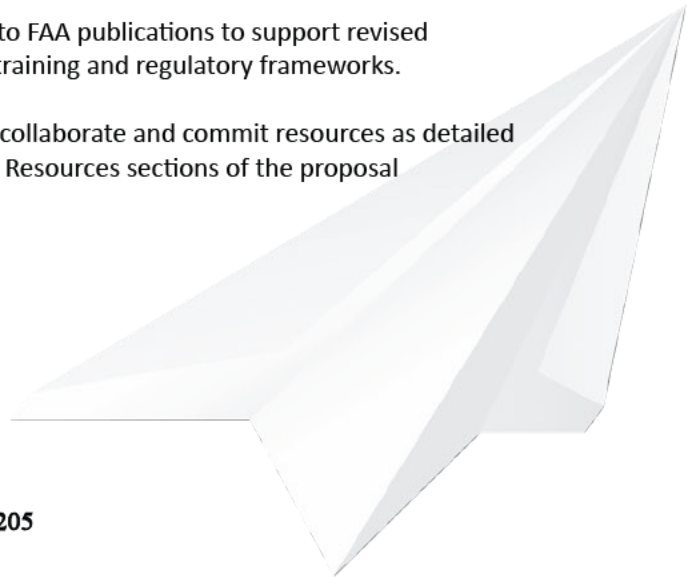
As part of this collaboration, ATEC will:

- Conduct industry and standards needs analyses to ensure curriculum and training initiatives are aligned with current and emerging workforce demands.
- Support the creation of hands-on projects designed to complement and reinforce computer-assisted instructional content.
- Market the program to postsecondary schools with aviation maintenance programs to drive adoption and participation.
- Facilitate matriculation opportunities between secondary and postsecondary programs, strengthening pathways into aviation technician careers.
- Using industry-developed standards, recommend changes to outdated FAA certification standards that currently limit aviation labor market flexibilities.
- Offer recommended training content for incorporation into FAA publications to support revised certification standards and promote alignment between training and regulatory frameworks.

If the proposal is selected for funding by NSF, it is my intent to collaborate and commit resources as detailed in the Project Description and Facilities, Equipment, and Other Resources sections of the proposal

Sincerely,

Crystal Maguire
Executive Director





September 30, 2025

National Science Foundation
Directorate for STEM Education
Division of Undergraduate Education
2415 Eisenhower Avenue
Alexandria, VA 22314

Re: AVIATE: Advancing AVionics in American Technical Education, a National ATE Consortium

Dear Program Officer:

Choose Aerospace is eager to collaborate with the project team to advance aviation technician education specifically in the area of avionics in aerospace. This initiative further Choose Aerospace's commitment to provide qualified workforce to meet growing demand for a skilled aviation maintenance technicians.

As an industry-driven nonprofit dedicated to modernizing aviation maintenance training and expanding access to high-quality education leading to high-wage careers, Choose Aerospace is committed to contributing its expertise and national network to strengthen the consortium's outcomes.

As part of this collaboration, Choose Aerospace will:

- Provide subject matter expertise to support curriculum development and ensure alignment with industry standards.
- Deploy curricular content across existing Choose Aerospace network, including secondary, post-secondary, apprenticeship, community-based, and corporate training programs, to support broad adoption and implementation.
- Provide program support to ensure effective integration and scalability within diverse training environments.
- Develop teacher and instructor guides, including hands-on projects, lesson plans, and supplemental activities to strengthen instructional delivery and enhance student engagement.
- Develop and deliver annual teacher training, equipping instructors with the tools and knowledge needed to implement the curriculum effectively and maintain instructional quality.

If the proposal is selected for funding by NSF, it is my intent to collaborate and commit resources as detailed in the Project Description and Facilities, Equipment, and Other Resources sections of the proposal.

Sincerely,

Crystal Maguire
Executive Director



September 9, 2025

National Science Foundation
Directorate for STEM Education
Division of Undergraduate Education
2415 Eisenhower Avenue
Alexandria, VA 22314

RE: Letter of Support for Project AVIATE

Dear Program Officer:

On behalf of AAR, I am proud to express our strong support for Project AVIATE to develop and implement a nationally scalable avionics-focused curriculum. As one of the largest independent providers of aviation services to commercial and government operators worldwide, AAR recognizes the urgent workforce crisis facing our industry and fully endorses this initiative.

The aerospace sector is experiencing a critical shortage of skilled technicians. At AAR, our global operations—including component repair, engineering, and maintenance services—are directly impacted. Recruiting, training, and retaining highly skilled avionics technicians is a top priority as we support both commercial airlines and U.S. government customers.

To address these challenges, AAR has invested significantly in workforce development through EAGLE Career Pathway Program. It has developed an extensive network of partnerships with schools, workforce boards, and community organizations. Yet the demand for well-prepared avionics talent continues to outpace supply. That is why we view Project AVIATE as a critical opportunity to expand the talent pipeline with high-quality, standardized training that meets employer needs and provides students with clear pathways into rewarding aviation careers.

Our contribution to the project will include:

- Advising on curriculum design and confirming alignment with employer needs;
- Mentoring instructors and supporting programs in our key operational regions;
- Establishing defined employment pathways so training leads directly to job opportunities at AAR and across the industry; and
- Validating success by assessing workforce outcomes such as credential attainment and employment readiness.

If this project is selected for funding by NSF, AAR is committed to collaborating with consortium partners and contributing resources as necessary.

AAR World Headquarters

1100 N. Wood Dale Rd., Wood Dale, Illinois 60191 | T +1.630.227.2000

Sincerely,

A handwritten signature in dark ink, appearing to read "Ryan Goertzen". The signature is fluid and cursive, with the first name "Ryan" and last name "Goertzen" clearly distinguishable.

Ryan Goertzen
Vice President Maintenance Workforce Development, AAR
President, Choose Aerospace



AIRCRAFT MECHANICS FRATERNAL ASSOCIATION

National Office: 7853 E. Arapahoe Court, Suite 1100 • Centennial, CO 80112

Tel: 303.752.AMFA (2632) • Fax: 303.362.7736

September 15, 2025

National Science Foundation
Directorate for STEM Education
Division of Undergraduate Education
2415 Eisenhower Avenue
Alexandria, VA 22314

RE: Letter of Support for Project AVIATE

On behalf of the Aircraft Mechanics Fraternal Association (AMFA), I am proud to express our strong support for Project AVIATE. As the only craft-specific labor union representing licensed aircraft maintenance technicians, AMFA recognizes the urgent workforce crisis facing our profession and fully endorses this initiative as a timely, innovative, and necessary solution.

The aerospace sector is experiencing a critical shortage of skilled technicians, especially in avionics, where advanced training is essential to maintain the safety and reliability of modern aircraft systems. Our members see this shortage firsthand in hangars and on the flight line. Recruiting, training, and retaining highly skilled avionics professionals is a pressing concern, as the demands of new technologies continue to grow while the current pipeline of qualified workers lags behind industry needs.

To address these challenges, AMFA has long advocated for improved training, stronger partnerships between education and industry, and pathways that connect students directly to high-quality careers. We view Project AVIATE as a vital opportunity to expand and modernize the technician pipeline by creating standardized, industry-aligned curriculum that will strengthen both the workforce and the profession.

To that end, our contribution to the project will include:

- Advising on content to ensure it reflects real-world practices and employer expectations;
- Supporting outreach to attract talent into aviation maintenance careers;
- Promoting apprenticeship and training pathways that lead directly to jobs with family-sustaining wages; and
- Providing feedback on program outcomes based on the lived experience of our members.

If this project is selected for funding by NSF, AMFA is committed to collaborating with consortium partners and contributing our expertise to achieve these objectives

Sincerely,

A handwritten signature in blue ink, appearing to read "Robert B. Cuth".

Director of Government Affairs
Aircraft Mechanics Fraternal Association (AMFA)



September 18, 2025

National Science Foundation
Directorate for STEM Education
Division of Undergraduate Education
2415 Eisenhower Avenue
Alexandria, VA 22314

RE: Collaborative Research: AVIATE: advancing AVionics in American Technical Education, a national ATE consortium - Addressing the education and workforce needs of the evolving aviation maintenance industry.

Dear Program Officer:

On behalf of Bombardier, Learjet Inc., we are proud to support the AVIATE project, a forward-thinking initiative addressing aviation maintenance workforce needs through virtual labs and experiential learning. This effort aligns with our commitment to innovative technical education and strengthens our collaboration with WSU Tech, ATEC, Choose Aerospace, and the NSF ATE Center. By leveraging advanced educational technologies, AVIATE will deliver an evidence-based curriculum tailored to industry demands and prepare the next generation of avionics professionals.

Bombardier designated Wichita as its U.S. Headquarters in 2022, home to Bombardier Defense, the Flight Test Center, and the company's largest U.S. Service Center. With over 60 years in Wichita, WSU Tech has been a vital partner in supplying skilled technicians.

Our engagement will include: (1) Identifying gaps in critical knowledge, skills, and abilities (KSAs) that are essential to industry success; (2) Sharing insights on current equipment and industry trends; (3) Supporting recruitment and retention strategies; and (4) Highlighting local workforce opportunities.

If the proposal submitted by WSU Tech entitled "**Collaborative Research: AVIATE: advancing AVionics in American Technical Education, a national ATE consortium**" is selected for funding by NSF, it is our intent to collaborate as detailed in the Project Description or the Facilities, Equipment and Other Resources section of the proposal.

Sincerely,

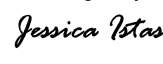
Signed by:


50087DB5A4E5466...

Derek Penn

Wichita Site Leader and GM CR&O

DocuSigned by:


A0E25761FD584E8...

Jessica Istas

Director, U.S. Academia, Aftermarket EHS, &
Community Relations

**Bombardier
Learjet Inc.**

1 Learjet Way, Wichita, KS 67209

E: Jessica.Istas@aero.bombardier.com 1 316.946.2671
bombardier.com

Page 187 of 205



September 29, 2025

Dr. Olga Pierrakos
National Science Foundation
Advanced Technological Education (ATE)
Directorate for Education and Human Services
4201 Wilson Boulevard
Arlington, VA 22230

Dear Dr. Pierrakos:

On behalf of KXR, I am pleased to express our strong commitment to collaborate on the NSF proposal aimed at transforming avionics technician education. KXR leads a National Science Foundation Advanced Technological Education (ATE) project dedicated to developing and scaling extended reality (XR) learning platforms that equip technical students with hands-on experiences simulating complex avionics maintenance, troubleshooting, and diagnostics.

Our expertise includes the design of XR-based curriculum modules for avionics, the integration of real-world and emerging aviation technologies into classroom settings, and ongoing evaluation of XR adoption in technician programs. KXR's platforms are deployed nationally to help close the gap between academic training and the workforce skills now required by employers in aviation and other advanced technical domains. As a collaborating organization, our roles in the proposed AVIATE project will include:

- Advising on the selection and deployment of XR hardware and software aligned with current and next-generation standards in aviation technician training.
- Sharing proven strategies and resources for integrating immersive simulations into course sequences to boost student recruitment and retention, and to foster persistence along avionics career pathways.
- Supporting the dissemination of findings by sharing effective XR modules, instructional materials, and outcomes through our national community of educators and workforce partners.

If the WSU Tech proposal entitled "Collaborative Research: AVIATE: Advancing AVionics in American Technical Education, a national ATE consortium" is selected for funding by NSF, it is our intent to collaborate as detailed in the Project Description or the Facilities, Equipment and Other Resources section of the proposal. Please feel free to contact me at 320.420.2801 or david@impactallies.com for any additional information.

Sincerely,

A handwritten signature in black ink, appearing to read "David Anderson", is written over a light blue rectangular background.

David Anderson, MSM, MBA, DC, DCBCN
Principal Investigator, KonnectXR
National Science Foundation ATE Program



September 29, 2025

National Science Foundation
Directorate for STEM Education
Division of Undergraduate Education
2415 Eisenhower Avenue
Alexandria, VA 22314

RE: Collaborative Research: AVIATE: advancing AVionics in American Technical Education, a national ATE consortium - Addressing the education and workforce needs of the evolving aviation maintenance industry.

Dear Program Officer:

On behalf of Mid-Continent Instruments and Avionics, we are proud to express our commitment to Wichita State University Campus of Applied Sciences and Technology (WSU Tech) and their efforts on the proposed avionics project. This initiative reflects our shared focus on addressing the pressing workforce needs in aviation maintenance by advancing innovative approaches to technical education through experiential learning and industry partnership. We are excited to continue our collaboration with WSU Tech to strengthen the avionics workforce and play a part in cultivating the next generation of aviators.

With more than 60 years of experience, Mid-Continent Instruments and Avionics manufactures, overhauls and repairs aircraft instruments, avionics, and advanced power solutions for the global aerospace industry. We proudly support general, business, and commercial aviation, defense and special missions, advanced air mobility and electric aircraft. Mid-Continent manufactures more than 38,000 units per year and processes more than 10,000 units in its overhaul, exchange, and repair operation. The Quality Management System of our Wichita, Kansas Manufacturing Facility is AS9100D and ISO9001:2015 certified.

If the proposal submitted by WSU Tech entitled **“Collaborative Research: AVIATE: advancing AVionics in American Technical Education, a national ATE consortium”** is selected for funding by NSF, it is our intent to collaborate as detailed in the Project Description or the Facilities, Equipment and Other Resources section of the proposal.

Sincerely,

A handwritten signature in black ink, appearing to read 'Van Winter', written over a light blue circular watermark.

Van Winter,
Senior Vice President of Sales and Marketing



National Center for Autonomous Technologies
13892 Airport Drive | Thief River Falls, MN 56701
NCAT@northlandcollege.edu | (218) 683-8801

September 18th, 2025

Dr. Olga Pierrakos, Christine Delahanty
Advanced Technological Education
National Science Foundation
2415 Eisenhower Avenue
Alexandria, VA 22314

RE: Collaborative Research: AVIATE: advancing AVionics in American Technical Education, a national ATE consortium - Addressing the education and workforce needs of the evolving aviation maintenance industry.

Dear Program Officer:

On behalf of the National Center for Autonomous Technologies (NCAT), we are proud to express our commitment to the proposed avionics project. This initiative reflects our shared focus on addressing the pressing workforce needs in aviation maintenance by advancing innovative approaches to technical education through virtual labs and experiential learning. We are excited to further strengthen our collaboration with Wichita State University Campus of Applied Sciences and Technology (WSU Tech), Aviation Technician Education Council (ATEC), Choose Aerospace, and the NSF ATE Center for Aviation and Automotive Technological Education Using Virtual E-Schools. The project leverages cutting-edge educational technologies to create an evidence-based curriculum defined by industry needs to prepare the avionics workforce.

This project will complement NCAT's work in crafting, adapting, and implementing educational resources to support 7-12 educators, and two-year college faculty in numerous disciplines to meet workforce demands while increasing the quality and diversity of the highly skilled technical workforce. This also supports our concerted effort focused on expanding educational resources to address current workforce demands, developing career pathways, and broadly engage stakeholders from education, industry, government, and related ATE centers and projects.

Our engagement with this project will include: 1) assisting in the identification of knowledge, skills, and abilities (KSA) gaps critical to industry success; 2) providing information on current equipment used to support alignment with industry trends; 3) supporting recruitment and retention strategies; and 4) identifying local workforce opportunities.

If the proposal submitted by WSU Tech entitled "**Collaborative Research: AVIATE: advancing AVionics in American Technical Education, a national ATE consortium**" is selected for funding by NSF, it is our intent to collaborate as detailed in the Project Description or the Facilities, Equipment and Other Resources section of the proposal.

Sincerely,

A handwritten signature in blue ink that reads "Jonathan Beck". The signature is fluid and cursive, with the first name "Jonathan" and last name "Beck" clearly legible.

Jonathan Beck | Executive Director
National Center for Autonomous Technologies
jonathan.beck@northlandcollege.edu
(320) 291-5380

September 24, 2025

National Science Foundation
Directorate for STEM Education
Division of Undergraduate Education
2415 Eisenhower Avenue Alexandria, VA 22314

RE: Collaborative Research: AVIATE: advancing AVionics in American Technical Education, a national ATE consortium - Addressing the education and workforce needs of the evolving aviation maintenance industry.

Dear Cognizant Program Officer:

On behalf of the National Cybersecurity Training and Education Center (NCyTE), we are pleased to express our commitment to the proposed AVIATE collaborative research project. This initiative reflects our shared focus on addressing the pressing workforce needs and critical infrastructure protection in the transportation sector.

As an ATE center focused on cybersecurity education, NCyTE is uniquely positioned to support this consortium through our subject matter expertise and prior work with avionics. Our specialized focus on the intersection of avionics and cybersecurity will be instrumental in critical research areas such as securing aviation data and analyzing the dimensions of cyber threats in avionics.

If the proposal submitted by WSU Tech entitled “Collaborative Research: AVIATE: advancing AVionics in American Technical Education, a national ATE consortium” is selected for funding by NSF, it is NCyTE’s intent to collaborate in the following ways.

- **Industry and Academic Partnerships:** NCyTE’s established network of industry and academic partners will enhance the consortium’s outreach and impact. We will actively foster collaboration and innovation, drawing on our extensive connections to facilitate meaningful engagement with key stakeholders in both the cybersecurity and Aviation domains to support recruitment and retention strategies and identifying local workforce opportunities.
- **Subject-Matter-Expertise:** NCyTE will provide cybersecurity SMEs (at least one from academia and one from aviation industry) to support cybersecurity integration and providing information on risk mitigation for current equipment used to support alignment with industry trends by attending meetings and curriculum development sessions, contribute to job-task analyses and assisting in the identification of knowledge, skills, and abilities (KSA) gaps critical to industry success.

Dr. Olga Pierrakos, Program Director
Advanced Technology Education
National Science Foundation
September 23, 2025
Page 2

- **Research Papers/Presentations:** NCyTE may co-author and support presentations on collaborative research.
- **Best Practices:** NCyTE will contribute to developing and disseminating best practices for integrating cybersecurity measures within the aviation and avionics sector. This will ensure that educational resources and PD are grounded in real-world applications and industry standards.

NCyTE SME participation in all activities will be virtual unless locations are local to SMEs or travel stipends are provided by the AVIATE project, or available to NCyTE through other means.

Our involvement in this consortium aligns with our mission to advance the integration of cybersecurity across critical infrastructure sectors through cutting-edge research, innovative educational practices, and strategic partnerships. We are confident that our participation will significantly contribute to the success of the grant proposal and the overall impact of the initiative.

We are excited to work directly with the AVIATE project's leadership team on this new endeavor.

Sincerely,



Michele Robinson, CISSP, CISM, CISA, CDPSE
Sr. Director/Principal Investigator
National Cybersecurity Training & Education Center



September 29, 2025

National Science Foundation
Directorate for STEM Education
Division of Undergraduate Education
2415 Eisenhower Avenue
Alexandria, VA 22314

RE: Letter of Support for Project AVIATE

On behalf of Putnam City School District, I am proud to express our strong support for Project AVIATE. As an early adopter of the Choose Aerospace aviation maintenance curriculum, Putnam City is committed to preparing students for high-demand technical careers in the aerospace industry. We recognize the urgent workforce needs facing aviation and fully endorse this initiative as a timely, innovative, and necessary solution.

The aerospace sector is experiencing a critical shortage of skilled technicians, particularly in avionics, where advanced training is essential to support increasingly complex aircraft systems. Expanding secondary-level training opportunities is a vital step toward building a sustainable workforce pipeline that connects students to meaningful, high-wage careers.

Putnam City School District currently offers the Choose Aerospace general aviation maintenance curriculum and will serve as one of the pilot sites for the new avionics content developed through Project AVIATE. This will allow our students to gain exposure to advanced systems knowledge earlier in their educational journey, better preparing them for postsecondary training and direct entry into the workforce.

As part of this project, Putnam City's contribution will include:

- Implementing and piloting the new avionics curriculum with high school students;
- Providing feedback on curriculum effectiveness from both instructors and learners;
- Engaging local industry partners to strengthen career pathways; and
- Sharing best practices with other secondary programs to support national scalability.

If this project is selected for funding by NSF, Putnam City School District is committed to collaborating with consortium partners and supporting efforts to build a strong, industry-aligned workforce pipeline.

5401 NW 40th St Oklahoma City, OK 73122
405.495.5200 | putnamcityschools.org



National Science Foundation
Directorate for STEM Education
Division of Undergraduate Education
2415 Eisenhower Avenue
Alexandria, VA 22314

September 26, 2025

RE: Collaborative Research: AVIATE: advancing AVionics in American Technical Education, a national ATE consortium - Addressing the education and workforce needs of the evolving aviation maintenance industry.

Dear Program Officer:

On behalf of The Regional Center for Nuclear Education and Training (RCNET), we are proud to express our commitment to the proposed avionics project. This initiative reflects our shared focus on addressing the pressing workforce needs in aviation maintenance by advancing innovative approaches to technical education through virtual labs and experiential learning. We are excited to further strengthen our collaboration with Indian River State College, Wichita State University Campus of Applied Sciences and Technology (WSU Tech), Aviation Technician Education Council (ATEC), Choose Aerospace, and the NSF ATE Center for Aviation and Automotive Technological Education Using Virtual E-Schools. The project leverages cutting-edge educational technologies to create an evidence-based curriculum defined by industry.

Funded initial by NSF ATE as a nuclear energy workforce center, RCNET has expanded a wide range of converging nuclear technologies that overlap with this work.

Our engagement with this project will include: 1) assisting in the identification of knowledge, skills, and abilities (KSA) gaps critical to industry success; 2) providing information on current equipment used to support alignment with industry trends; 3) supporting recruitment and retention strategies; and 4) identifying local workforce opportunities.

If the proposal submitted by WSU Tech entitled “**Collaborative Research: AVIATE: advancing AVionics in American Technical Education, a national ATE consortium**” is selected for funding by NSF, it is our intent to collaborate as detailed in the Project Description or the Facilities, Equipment and Other Resources section of the proposal.

Sincerely,

Shannon Wood

Shannon Wood, Director
Regional Center for Nuclear Education and Training
Indian River State College
772-267-8149



September 29, 2025

Dr. Olga Pierrakos
Lead Program Director, Advanced Technological Education
National Science Foundation
2415 Eisenhower Avenue
Alexandria, VA 22315

Dear Dr. Pierrakos:

On behalf of RECITE, I am pleased to confirm our intention to collaborate on the NSF AVIATE proposal to transform avionics technician education. RECITE is a multi-institutional NSF ATE effort focused on accelerating the use of extended reality (XR) technologies, such as augmented and virtual reality, throughout technician education in STEM fields. RECITE brings leading expertise in professional development for XR instructional design, building a robust ecosystem for XR adoption and sharing accessible XR resources nationally.

Our work includes creating and distributing XR-centric training programs for faculty, developing an open repository of XR content, and building collaborative networks to support and scale successful XR integration across technical domains, including aviation technologies.

To support AVIATE, RECITE commits to the following:

- Provide consultation and up-to-date guidance on XR standards and best practices relevant to avionics technician education, ensuring the project draws on cross-cutting insights from multiple technical fields.
- Support recruitment and retention strategies through engaging, hands-on VR learning experiences that enhance student engagement and persistence in technician pathways.
- Assist in dissemination by integrating AVIATE products and deliverables into RECITE's XR repositories and by sharing project outcomes broadly with the national community of educators, industry partners, and workforce development networks.

Upon NSF funding of the WSU Tech proposal "Collaborative Research: AVIATE: Advancing Avionics in American Technical Education," RECITE intends to collaborate as described in the Project Description or the Facilities, Equipment and Other Resources section.

Sincerely,

David Anderson, MSM, MBA, DC, DCBCN
Director & Principal Investigator, Resource Collaborative for Immersive Technologies (RECITE)
National Science Foundation ATE Program
Impact Allies
www.recitexr.org



Phone

320-420-2801



Email

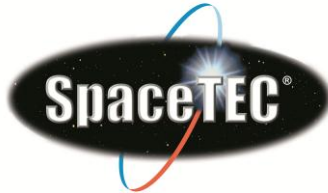
david@impactallies.com



Address

2002 Cordova Ave

Page 196 of 205 Vero Beach, FL 32960



September 23, 2025

National Science Foundation
Directorate for STEM Education
Division of Undergraduate Education
2415 Eisenhower Avenue
Alexandria, VA 22314

RE: Collaborative Research: AVIATE: advancing AVionics in American Technical Education, a national ATE consortium - Addressing the education and workforce needs of the evolving aviation maintenance industry.

Dear Program Officer:

On behalf of SpaceTEC Partners Inc. (SPI), we are proud to express our commitment to the proposed avionics project. This initiative reflects our shared focus on addressing the pressing workforce needs in aviation maintenance by advancing innovative approaches to technical education through virtual labs and experiential learning. We are excited to further strengthen our collaboration with Wichita State University Campus of Applied Sciences and Technology (WSU Tech), Aviation Technician Education Council (ATEC), Choose Aerospace, and the NSF ATE Center for Aviation and Automotive Technological Education Using Virtual E-Schools. The project leverages cutting-edge educational technologies to create an evidence-based curriculum defined by industry needs to prepare the avionics workforce.

SpaceTEC Partners Inc. (SPI), founded as an NSF ATE Center in 2002, is now a 501c3 non-profit corporation dedicated to aerospace and aviation technician workforce development and credentialing in key domains where the integration of virtual curricula and hybrid e-learning tools is particularly relevant. AVIATE's commitment to developing and delivering avionics-focused interactive digital learning education resources for aviation maintenance technicians is vital to the growth and global competitiveness of our industry.

Our engagement with this project will include: 1) assisting in the identification of knowledge, skills, and abilities (KSA) gaps critical to industry success; 2) providing information on current equipment used to support alignment with industry trends; 3) supporting recruitment and retention strategies; and 4) identifying local workforce opportunities.

If the proposal submitted by WSU Tech entitled "Collaborative Research: AVIATE: advancing AVionics in American Technical Education, a national ATE consortium" is selected for funding by NSF, it is our intent to collaborate as detailed in the Project Description or the Facilities, Equipment and Other Resources section of the proposal.

Sincerely,

A handwritten signature in black ink, appearing to read "Steve Kane".

Steve Kane,
Executive Director
SpaceTEC Partners, Inc.



AN ALEUT COMPANY

2901 Wall Triana Hwy
Suite 200
Huntsville, AL 35824
(256) 713-0482 phone
(256) 705-8776 fax

DATE 4 Sep 2025

National Science Foundation
Directorate for STEM Education
Division of Undergraduate Education
2415 Eisenhower Avenue
Alexandria, VA 22314

RE: Collaborative Research: AVIATE: advancing AVionics in American Technical Education, a national ATE consortium -
Addressing the education and workforce needs of the evolving aviation maintenance industry.

Dear Program Officer:

On behalf of Strata-G Solutions Inc, an ALEUT company, we are proud to express our commitment to the proposed avionics project. This initiative reflects our shared focus on addressing the pressing workforce needs in aviation maintenance by advancing innovative approaches to technical education through virtual labs and experiential learning. We are excited to further strengthen our collaboration with Calhoun Community College, Wichita State University Campus of Applied Sciences and Technology (WSU Tech), Aviation Technician Education Council (ATEC), Choose Aerospace, and the NSF ATE Center for Aviation and Automotive Technological Education Using Virtual E-Schools. The project leverages cutting-edge educational technologies to create an evidence-based curriculum defined by industry needs to prepare the avionics workforce.

Established in 2004, Strata-G is an agile and innovative Small Business Administration (SBA) certified 8(a) Small Disadvantaged Business (SDB). Strata-G is a wholly owned subsidiary of the Aleut SGS Holding Company, LLC—a subsidiary of the Aleut Corporation, an Alaska Native Corporation (ANC). Strata-G is a company that executes engineering, rapid prototyping, manufacturing & assembly, warehousing, kitting & distribution and culminates with the project management of those disciplines to achieve program support for the commercial and defense industries.

Our engagement with this project will include: 1) assisting in the identification of knowledge, skills, and abilities (KSA) gaps critical to industry success; 2) providing information on current equipment used to support alignment with industry trends; 3) supporting recruitment and retention strategies; and 4) identifying local workforce opportunities.

If the proposal submitted by WSU Tech entitled "**Collaborative Research: AVIATE: advancing AVionics in American Technical Education, a national ATE consortium**" is selected for funding by NSF, it is our intent to collaborate as detailed in the Project Description or the Facilities, Equipment and Other Resources section of the proposal.

Sincerely,

A handwritten signature in blue ink, appearing to read "Calvin Lane".

Calvin Lane

Executive Vice President/
GM, Aleut Defense Services



September 18, 2025

National Science Foundation
Directorate for STEM Education
Division of Undergraduate Education
2415 Eisenhower Avenue
Alexandria, VA 22314

RE: Collaborative Research: AVIATE: advancing AVionics in American Technical Education, a national ATE consortium - Addressing the education and workforce needs of the evolving aviation maintenance industry.

Dear Program Officer:

On behalf of Textron Aviation, we are proud to express our commitment to the proposed avionics project. This initiative reflects our shared focus on addressing the pressing workforce needs in aviation maintenance by advancing innovative approaches to technical education through virtual labs and experiential learning. The project leverages cutting-edge educational technologies to create an evidence-based curriculum defined by industry needs to prepare the avionics workforce.

Textron Aviation has been inspiring the journey of flight for nine decades and continues to be the global leader by equipping customers with smart solutions for every circumstance, every mission. We are passionate advocates of aviation, providing aircraft that save time and empower people with the freedom of flight.

Our engagement with this project will include: 1) assisting in the identification of knowledge, skills and abilities (KSA) gaps critical to industry success; 2) providing information on current equipment used to support alignment with industry trends; 3) supporting recruitment and retention strategies; and 4) identifying local workforce opportunities.

If the proposal submitted by WSU Tech entitled "**Collaborative Research: AVIATE: advancing AVionics in American Technical Education, a national ATE consortium**" is selected for funding by NSF, it is our intent to collaborate as detailed in the Project Description or the Facilities, Equipment and Other Resources section of the proposal.

Sincerely,

Michele D. Gifford
HR Director, Talent Acquisition and Workforce Programs
Textron Aviation



YINGLING AVIATION LLC
2010 S. Airport Rd.
Wichita, Ks 67220
316-943-3246

National Science Foundation
Directorate for STEM Education
Division of Undergraduate Education
2415 Eisenhower Avenue
Alexandria, VA 22314

25 Sept 2025

RE: Collaborative Research: AVIATE: advancing Avionics in American Technical Education, a national ATE consortium - Addressing the education and workforce needs of the evolving aviation maintenance industry.

Dear Program Officer:

On behalf of Yingling Aviation, we are pleased to express our strong support for the proposed Collaborative Research: AVIATE: Advancing Avionics in American Technical Education, a National ATE Consortium.

With more than 70 years of service in Wichita's aviation industry, Yingling Aviation has a long history of supporting aircraft maintenance, modifications, and workforce development. We are currently expanding this legacy through a registered apprenticeship program that creates structured career pathways for aircraft mechanics and avionics specialists. In partnership with Wichita State University Campus of Applied Sciences and Technology (WSU Tech), we are aligning technical training with real-world industry requirements and providing teaching assistance to ensure students are prepared for FAA certification and career success.

Our engagement in this project will include:

- Helping identify the knowledge, skills, and abilities most critical to industry success;
- Sharing information on current equipment and practices to align curriculum with industry trends;
- Supporting recruitment and retention strategies; and
- Highlighting local workforce opportunities.

If selected for NSF funding, Yingling Aviation intends to collaborate fully as described in the proposal. We are excited to work alongside WSU Tech, the Aviation Technician Education Council (ATEC), Choose Aerospace, and the NSF ATE Center for Aviation and Automotive Technological Education Using Virtual E-Schools to deliver innovative, evidence-based training that prepares the next generation of avionics professionals.

Sincerely,



Jeff Proskauer
Training and SMS Manager,
Yingling Aviation

Other Supplementary Documents

Data Not Available

List of Suggested Reviewers

Data Not Available

List of Suggested Reviewers

Data Not Available

List of Reviewers Not to Include

Data Not Available

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Data Not Available