Fairbanks North Star Borough School District

Career & Technical Education Curriculum

Aviation Courses

Adopted April 6, 2021

Table of Contents

Introduction

Aviation Courses

Acknowledgements

Curriculum Writers

Joni Simpson – CTE Director
Dan Domke – CTE Director (retired)
Travis Stagg – West Valley High School

Department of Teaching and Learning

Melanie Hadaway – Executive Director of Teaching & Learning
Rachel Reilly – Curriculum Coordinator (Secondary Schools)
Jennifer Morgan – Materials Development Specialist

We would also like to recognize the Board Curriculum Committee and the many teachers, administrators, parents, students, and community members for their contributions to this document.

Acronyms

ACC	Alaska Core Competencies
AKCIS	Alaska Career Information System
CTC	Community and Technical College
CTE	Career Technical Education
CTEPS	Career and Technical Education Program of Study
CTSO	Career Technical Student Organization
FAA	Federal Aviation Administration
FNSBSD	Fairbanks North Star Borough School District
GPS	Global Positioning System
OSHA	Occupational Safety and Health Administration
PLCP	Personal Learning and Career Plan
PLTW	Project Lead the Way
RPC	Recognized Post-secondary Credential
STEM	Science, Technology, Engineering, and Math
TSA	Technology Student Association
UAA	University of Alaska - Anchorage
UAF	University of Alaska – Fairbanks
USDOL	United States Department of Labor
WS	Writing Standards
VOR	Very high frequency Omni-directional Range

Explanation of Terms

General Terms and Definitions

Career Cluster: A career cluster is a structure for organizing and delivering quality CTE programs around occupations and broad industries.

Career Pathway: A career pathway is a strand of a career cluster that centers on a common set of academic, technical, and workplace skills and knowledge. It is a sector from the broader career cluster.

CTEPS: CTEPS stands for "Career and Technical Education Program of Study" which is also called Program of Study or POS. It is a coherent and aligned sequence of educational elements that begins at secondary school and continues without duplication or remediation into postsecondary education/training, and that leads to an industry recognized credential or certificate, or an associate or baccalaureate degree. (See Program of Study)

Program of Study (POS): A program of study is designed to provide successful student transitions between secondary and postsecondary education. A program of study is a comprehensive, structured approach for delivering academic and career and technical education to prepare students for postsecondary education and career success. (See CTEPS)

Sequence: A sequence is a group of courses that a student may take within a cluster, usually in a progression of foundational skills to more focused and higher level skills.

CTE Specific Terms

Career and Technical Student Organization (CTSO): A CTSO is an organization for students enrolled in a CTE program that engages in CTE activities as an integral part of the instructional program. Alaska has six (6) recognized CTSOs: Business Professionals of America (BPA); Family, Career, and Community Leaders of America (FCCLA); Health Occupations Students of America (HOSA)- Future Health Professionals; DECA – an Association of Marketing Students; FFA – Agricultural Education; and SkillsUSA.

Concentrator: A secondary student who has earned two (2) courses in a single CTE pathway within those career clusters where 2 credit sequences are recognized by the State and its local eligible recipients, or where the student has documented proficiencies that are equivalent to this criteria.

Concurrent Enrollment: A written agreement between a secondary and a postsecondary program that allows a high school course taught by a high school teacher to qualify for postsecondary credit.

Participant: A secondary student who has earned credit in one (1) or more approved course(s) in any career and technical education (CTE) program area.

Curriculum Terms

Alaska Content Standards: Content standards are broad statements, adopted by the State Board of Education and Early Development, indicating what students should know and be able to do as a result of their public school experience.

Alaska Cultural Standards: The Alaska Cultural Standards for Students were developed by the Alaska Native Knowledge Network and adopted by the State Board of Education & Early Development in 1998. Cultural Standards are meant to enrich the Content Standards and provide guidelines for nurturing and building in students the rich and varied cultural traditions that continue to be practiced in communities throughout Alaska. The standards are broad statements of what students should know and be able to do as a result of their experience in a school that is aware of and sensitive to the surrounding physical and cultural environment.

Alaska Employability Standards: Alaska's Employability standards are to be used in conjunction with Alaska's academic content and performance standards to ensure Alaska's student have the skills and knowledge necessary to be good citizens, effective parents, productive workers, and most of all, life-long learners. Alaska's students are expected to learn how to learn and apply their skills and knowledge in a variety of settings to create a satisfying and productive life. These standards are designed to promote successful student transition from school to work.

Alaska Performance Standards: Performance standards are measureable statements of learning expectations, adopted by the State Board of Education and Early Development, indicating what students should know and be able to do as a result of their public school experience. Alaska has adopted Performance Standards in reading, writing, mathematics, and science.

All Aspects of Industry: All Aspects of Industry essentially provides a set of standards for all CTE courses. All Aspects of Industry defines nine aspects common to any business or enterprise: planning; management; finance; technical and production skills; principles of technology; labor issues; community issues; health, safety and environment; personal work habits.

Personal Learning Plan: A personal learning plan is developed by students – typically in collaboration with teachers, counselors, and parents – as a way to help them achieve short- and long-term goals, most commonly at the middle and high school levels. Students can chart a personal educational program that will allow them to achieve their educational and aspirational goals, while also fulfilling school requirements such as particular credit or course requirements for graduation. A personal learning plan also documents major learning accomplishments or milestones.

Student Performance Standards: Student performance standards are statements of the essential skills, knowledge, and tasks that FNSBSD students are expected to master in the course. These are developed at the district level.

Science, Technology, Engineering, & Mathematics (STEM) Overview

The Science, Technology, Engineering and Mathematics (STEM) Cluster includes planning, managing and providing scientific research and professional and technical services (e.g., physical science, social science, engineering), including laboratory and testing services and research and development services.

The Fairbanks North Star Borough School District STEM Cluster courses may be sequenced into a variety of Programs of Study including, but not limited to:

- Aviation
- Engineering & Technology
- Science & Math
- Drafting and Design

Each school will develop Programs of Study based on availability of courses. Programs of Study are suggestions to help guide the development of individual Personal Learning Plans (PLP). Students may choose courses from multiple clusters as they design a PLP.

Many courses within this cluster are articulated for credit with University of Alaska Fairbanks/Community and Technical College through a dual credit agreement. This agreement allows students to earn postsecondary credit while taking a course from an approved high school instructor.

The Aviation curriculum is aligned to the following standards:

- Alaska Cultural Standards
- Alaska Employability Standards
- Alaska English/Language Arts Standards
- Alaska Math Standards
- Alaska Science Standards
- Federal Aviation Administration (FAA) Private Pilot - Airplane: Airman Certification Standards

The complete text of these standards may be found in the appendix.

Career & Technical Education

Science, Technology, Engineering, & Mathematics (STEM):

Aviation Courses

Private Pilot Ground School 1A

COURSE INFORMATION	
Course Name:	Private Pilot Ground School 1A
Course Number:	CTEE309
Grade(s):	11 – 12
Length (# of semesters):	One semester
Credit:	0.5
Foundational Course:	☐ This is a foundational CTE course (foundational courses are not technical)
Prerequisites:	Algebra I
Sequence or CTEPS:	STEM - Engineering
Date of District Course Revision:	Spring 2021
CAREER & TECHNICAL STUDENT ORGANIZATION (CTSO)	
CTSO Embedded in this Sequence:	SkillsUSA and/or Technology Student Association (TSA)
TECHNICAL/OCCUPATIONAL STANDARDS	
Source(s) of Technical Standards:	Federal Aviation Administration (FAA) Private Pilot – Airplane: Airman Certification Standards
Names/Numbers of Technical Standards:	FAA-S-ACS-6
REGISTRATION INFORMATION	
Course Description: (Brief paragraph - as will be shown in the student course catalog)	This course will introduce occupations in professional piloting, aviation infrastructure, and aviation maintenance. Students will have the opportunity for field trips, career investigations, and FAA certification testing. (In order to have the FNSBSD instructor sign-off that a student is ready to test, the student must complete semesters 1 and 2. FNSBSD recognizes instruction for this license can happen in a variety of ways outside the district, often in shorter duration.)
Instructional Topic Headings: (Separate each heading with a semi-colon.)	Flight Fundamentals, Flight Operations, and Pilot Training: Aviation careers; Aircraft design and systems; Flight instruments; Aerodynamics; Flight safety; Airports and airspace; ATC services
POSTSECONDARY CREDENTIAL	
Recognized Postsecondary Credential (RPC): *(Replaces Technical Skills Assessment (TSA) - not all TSAs will qualify as an RPC, and RPC is not required for all courses)*	Student Pilot Certificate* Airman Knowledge Test** *Requires the completion of Semesters 1A & 1B **Requires the completion of Semesters 1A & 1B and the endorsement from the instructor that they are ready to test.
STANDARDS	
This course addresses (enter yes/no)**:**	
Alaska English Language Arts and Math Standards:	Yes
Alaska Cultural Standards:	Yes

All Aspects of Industry (AAI):	Yes
Core Technical Standards:	Yes
Employability Standards:	Yes
EMPLOYABILITY STANDARDS	
Employability Standards source:	Alaska Employability Standards
DUAL CREDIT AGREEMENT	
CTSO participation is included:	Yes, SkillsUSA and/or Technology Student Association (TSA)
Current Dual Credit Agreement: *(Agreements should be reviewed and updated annually)*	☐ *(If checked, complete the Dual Credit section below.)*
Date of Current Agreement:	N/A
Postsecondary Institution Name:	N/A
Postsecondary Course Name:	N/A
Postsecondary Course Number:	N/A
Postsecondary Course Credits:	N/A
AUTHOR	
Course Developed By:	Dan Domke, Joni Simpson, and Travis Stagg
Course Adapted From:	FAA Private Pilot Ground School
Date of Previous Course Revision:	N/A
COURSE DELIVERY MODEL	
Is this course brokered through another institution or agency? (yes/no)	No

Standards Alignment							
Student Performance Standards (Instructional Topic Headings)	**Specific Technical Skills Standards**	**Alaska English/ Language Arts Standards**	**Alaska Math Standards**	**Alaska Science Standards**	**Alaska Cultural Standards**	**Employability/ Career Readiness Standards**	**Assessment**
Students will understand how specific careers addressed in this course fit within all aspects of the aviation industry.	PA.I.A.K1 PA.I.A.K2 PA.I.A.K3 PA.I.A.K4 PA.I.A.K5	Reading 1,2,4 Writing 2abde,4,10 Speaking/ Listening 1.a,b,c	S-ID-9	HS-PS2-5MS-ESS2-5	A1; A7 B4; E2; E4	A1-6 B2-5	Essential questions, workbooks, and written exams
Students will demonstrate an understanding of different aircraft and their flight systems.	PA.I.G.K1 including all sub elements	Reading 1-4,7,8,10 Writing 2 (a-f), 4-8 Speaking 1-6	F-BF	HS-PS2-3HS-PS2-4HS-PS3-2MS-ESS2-5	A1; A7 B4; E2; E4	A2	Quizzes, tests, demonstration on simulators, and presentation
Students will demonstrate their knowledge of flight instruments and how they affect the flight of an aircraft.	PA.I.G.K1 including all sub elements	Reading 1-4,7,8,10 Writing 2 (a-f), 4-8 Speaking 1-6	A-CED 1,2 F-BF G-CO 1,2,4,5 S-ID-9 S-CP.2 S-CP.9	HS-PS2-6HS-PS1-4HS-PS1-5HS-PS2-3HS-PS2-4HS-PS2-5HS-PS3-2HS-PS3-4MS-ESS1-2 MS-ESS2-5	A1; A7 B4; E2; E4	A2	Quizzes, tests, demonstration on simulators, and presentation
Students will understand the process of becoming a licensed pilot.	PA.I.A.K1	Reading 1-4,7,8,10 Writing 2 (a-f)			A1; A7 B4; E2; E4	A3, 5, 6 B2-5	Quizzes and tests
Students will understand the aerodynamics of an aircraft and how that affects flight.	PA.IV.B.K1 PA.IV.B.K2 PA.IV.B.K3	Reading 1-4,7,8,10 Writing 2 (a-f), 4-8 Speaking 1-6	A-CED 1,2 F-BF G-CO 1,2,4,5 G-MG S-ID-9 S-CP.2 S-CP.9	HS-PS2-6HS-PS1-4 HS-PS1-7HS-PS2-3HS-PS2-4HS-PS2-5HS-PS3-4MS-ESS1-2 MS-ESS2-5	A1; A7 B4; E2; E4	A2	Quizzes, tests, and presentation

Standards Alignment							
Student Performance Standards (Instructional Topic Headings)	**Specific Technical Skills Standards**	**Alaska English/ Language Arts Standards**	**Alaska Math Standards**	**Alaska Science Standards**	**Alaska Cultural Standards**	**Employability/ Career Readiness Standards**	**Assessment**
Students will demonstrate an understanding of all aspects of flight safety.	PA.I.H.K1 including all sub elements. Every section in the standards addresses flight safety	Reading 1-4,7,8,10 Writing 2 (a-f), 4-8 Speaking 1-6	F-BF G.CO 1,2,4,5 G-MG S-ID-9 S-CP.2 S-CP.9	HS-PS2-6HS-PS1-4HS-PS1-5HS-PS1-7HS-PS2-3HS-PS2-4HS-PS2-5HS-PS3-2HS-PS3-4 MS-ESS1-2 MS-ESS2-5	A1; A7 B4; E2; E4	A2, 6	Quizzes, tests, and presentation
Students will understand the legal definition and all the legal aspects of airports and airspace.	PA.I.E.K1 PA.I.E.K2 PA.I.E.K3 PA.III.B.K1 PA.III.B.K2 PA.III.B.K3 PA.III.B.K4	Reading 1-4,7,8,10 Writing 2 (a-f), 4-8	S-ID-9	HS-PS2-4MS-ESS2-5	A1; A7 B4; E2; E4	A2,6	Quizzes and tests
Students will demonstrate an understanding of air traffic control services.	PA.III.A.K1 PA.III.A.K2 PA.III.A.K3 PA.III.A.K4 PA.III.A.K5 PA.III.A.K6 PA.III.A.K7 PA.III.A.K8 PA.III.A.K9	Reading 1-4,7,8,10 Writing 2 (a-f), 4-8	G-MG S-ID-9 S-CP.2	HS-PS1-5HS-PS2-4HS-PS2-5MS-ESS2-5	A1; A7 B4; E2; E4	A2,6	Quizzes and tests

INSTRUCTIONAL RESOURCES	
List the major instructional resources used for this course:	
Websites:	https://www.faa.gov
Textbooks:	Jeppeson's Private Pilot and Test Prep Online Course Jeppesen *Guided Flight Discovery: Private Pilot* (2018) (This course uses instructional materials approved or required by the associated industry and/or certifying organizations. As those standards or assessments are updated, instructional materials will update accordingly.)
Essential Equipment:	Flight simulators and peripherals, simulator software
Reference Materials:	https://www.faa.gov/regulations_policies/handbooks_manuals/aviation https://www.faa.gov/training_testing/testing/acs/media/private_airplane_acs_change_1.pdf
Supplies:	

Private Pilot Ground School 1B

COURSE INFORMATION	
Course Name:	Private Pilot Ground School 1B
Course Number:	CTEE310
Grade(s):	11 – 12
Length (# of semesters):	One semester
Credit:	0.5
Foundational Course:	☐ This is a foundational CTE course (foundational courses are not technical)
Prerequisites:	Private Pilot Ground School 1A
Sequence or CTEPS:	STEM - Engineering
Date of District Course Revision:	Spring 2021
CAREER & TECHNICAL STUDENT ORGANIZATION (CTSO)	
CTSO Embedded in this Sequence:	SkillsUSA and/or Technology Student Association (TSA)
TECHNICAL/OCCUPATIONAL STANDARDS	
Source(s) of Technical Standards:	Federal Aviation Administration (FAA) Private Pilot – Airplane: Airman Certification Standards
Names/Numbers of Technical Standards:	FAA-S-ACS-6
REGISTRATION INFORMATION	
Course Description: (Brief paragraph - as will be shown in the student course catalog)	This course is a continuation of Private Pilot Ground School 1A and will introduce occupations in professional piloting, aviation infrastructure, and aviation maintenance. Students will have the opportunity for field trips, career investigations, and FAA certification testing. (In order to have the FNSBSD instructor sign-off that a student is ready to test, the student must complete semesters 1 and 2. FNSBSD recognizes instruction for this license can happen in a variety of ways outside the district, often in shorter duration.)
Instructional Topic Headings: (Separate each heading with a semi-colon.)	Aviation Weather, Aircraft Performance, and Navigation: weather theory and hazards; forecasting weather and services; weight and balance; performance chart interpretation; pilotage and dead reckoning; VOR navigation; and GPS
POSTSECONDARY CREDENTIAL	
Recognized Postsecondary Credential (RPC): *(Replaces Technical Skills Assessment (TSA) - not all TSAs will qualify as an RPC, and RPC is not required for all courses)*	Student Pilot Certificate* Airman Knowledge Test** *Requires the completion of Semesters 1A & 1B **Requires the completion of Semesters 1A & 1B and the endorsement from the instructor that they are ready to test.
STANDARDS	
This course addresses (enter yes/no)**:**	
Alaska English Language Arts and Math Standards:	Yes
Alaska Cultural Standards:	Yes

All Aspects of Industry (AAI):	Yes
Core Technical Standards:	Yes
Employability Standards:	Yes
EMPLOYABILITY STANDARDS	
Employability Standards source:	Alaska Employability Standards
DUAL CREDIT AGREEMENT	
CTSO participation is included:	Yes, SkillsUSA and/or Technology Student Association (TSA)
Current Dual Credit Agreement: *(Agreements should be reviewed and updated annually)*	☐ *(If checked, complete the Dual Credit section below.)*
Date of Current Agreement:	N/A
Postsecondary Institution Name:	N/A
Postsecondary Course Name:	N/A
Postsecondary Course Number:	N/A
Postsecondary Course Credits:	N/A
AUTHOR	
Course Developed By:	Dan Domke, Joni Simpson, and Travis Stagg
Course Adapted From:	FAA Private Pilot Ground School
Date of Previous Course Revision:	N/A
COURSE DELIVERY MODEL	
Is this course brokered through another institution or agency? (yes/no)	No

Standards Alignment							
Student Performance Standards (Instructional Topic Headings)	**Specific Technical Skills Standards**	**Alaska English/ Language Arts Standards**	**Alaska Math Standards**	**Alaska Science Standards**	**Alaska Cultural Standards**	**Employability/ Career Readiness Standards**	**Assessment**
Students will understand weather theory and its hazards.	PA.I.C.K1 PA.I.C.K2 PA.I.C.K3 PA.I.C.K3a-i PA.I.C.K4 PA.I.C.R1 PA.I.C.R1a-c PA.I.C.R2a-c	Reading 1-4,7,8,10 Writing 2 (a-f), 4-8 Speaking 1-6	S-ID.1 - 9 F-IF.9 F-BF.1	ESS2.D ESS2-5 ESS2-6 MS-ETS1-3	A5, B2	A1 & 2 B2 & 3	Quizzes, tests, demonstration on simulators, and presentation
Students will demonstrate an understanding of forecasting weather and weather services.	PA.I.C.K1 PA.I.C.K2 PA.I.C.K3 PA.I.C.K3a-i PA.I.C.K4 PA.I.C.R1 PA.I.C.R1a-c PA.I.C.R2a-c	Reading 1-4,7,8,10 Writing 2 (a-f), 4-8 Speaking 1-6	S-ID.1 - 9 F-IF.7 F-BF.1	ESS2.D ESS2-5 ESS2-6 MS-ESS3-2	A5, B2	A1 & 2 B2 & 3	Quizzes, tests, demonstration on simulators, and presentation
Students will demonstrate they understand how weight and balance affects an aircraft.	PA.I.F.K2a-f	Reading 1-4,7,8,10 Writing 2 (a-f), 4-8 Speaking 1-6	S-ID.1 - 9 F-IF.7 F-IF.9 F-BF.1 A-REI.7	MS-ETS1-1MS-ETS1-3	A5, B2	A1 & 2 B2 & 3	Quizzes, tests, demonstration on simulators, and presentation
Students will demonstrate an understanding of performance chart interpretation.	PA.VI.A.K1 PA.VI.A.K2 PA.VI.A.K3 PA.VI.A.K4a-c PA.VI.A.K5a-d PA.VI.A.K6 PA.VI.A.K7	Reading 1-4,7,8,10 Writing 2 (a-f), 4-8 Speaking 1-6	S-ID.1 - 9 F-IF.7 F-IF.9 F-BF.1 A-REI.7	ESS2.D MS-ETS1-3	A5, B2	A1 & 2 B2 & 3	Quizzes, tests, demonstration on simulators, and presentation
Students will demonstrate an understanding of navigation by reading a map and comparing it to terrain and landmarks (pilotage.)	PA.VI.A.K1 PA.VI.A.K2 PA.VI.A.K3 PA.VI.A.K4a-c PA.VI.A.K5a-d PA.VI.A.K6-K7	Reading 1-4,7,8,10 Writing 2 (a-f), 4-8 Speaking 1-6	S-ID.1 - 9 F-IF.7 F-IF.9 F-BF.1 A-REI.7	ESS2-5 ESS2-6 MS-ETS1-3	A5, B2	A1 & 2 B2 & 3	Quizzes, tests, demonstration on simulators, and presentation

Standards Alignment							
Student Performance Standards (Instructional Topic Headings)	**Specific Technical Skills Standards**	**Alaska English/ Language Arts Standards**	**Alaska Math Standards**	**Alaska Science Standards**	**Alaska Cultural Standards**	**Employability/ Career Readiness Standards**	**Assessment**
Students will demonstrate an understanding of navigation by using ground speed, compass readings, clock, and initial position (dead reckoning.)	PA.VI.A.K1 PA.VI.A.K2 PA.VI.A.K3 PA.VI.A.K4a-c PA.VI.A.K5a-d PA.VI.A.K6 PA.VI.A.K7	Reading 1-4,7,8,10 Writing 2 (a-f), 4-8 Speaking 1-6	S-ID.1 - 9 F-IF.7 F-IF.9 F-BF.1 A-REI.7	ESS2.D ESS2-5 ESS2-6 MS-ETS1-3	A5, B2	A1 & 2 B2 & 3	Quizzes, tests, demonstration on simulators, and presentation
Students will demonstrate an understanding of navigation through VOR.	PA.I.D.K1 PA.I.D.K2 PA.I.D.K3a-c PA.I.D.K4 PA.I.D.K5 PA.I.E.K1 PA.I.E.K2 PA.I.E.K3 PA.I.E.K4	Reading 1-4,7,8,10 Writing 2 (a-f), 4-8 Speaking 1-6	S-ID.1 - 9 F-IF.7 F-IF.9 F-BF.1 A-REI.7	ESS2.D MS-ETS1-3	A5, B2	A1 & 2 B2 & 3	Quizzes, tests, demonstration on simulators, and presentation
Students will demonstrate and understanding of navigation through the use of GPS.	PA.VI.B.K1 PA.VI.B.K2 PA.VI.B.K3 PA.VI.B.K4	Reading 1-4,7,8,10 Writing 2 (a-f), 4-8 Speaking 1-6	S-ID.1 - 9 F-IF.7 F-IF.9 F-BF.1 A-REI.7	ESS2-5 ESS2-6 MS-ETS1-3	A5, B2		Quizzes, tests, demonstration on simulators, and presentation

INSTRUCTIONAL RESOURCES	
List the major instructional resources used for this course:	
Websites:	https://www.faa.gov
Textbooks:	Jeppeson's Private Pilot and Test Prep Online Course Jeppesen *Guided Flight Discovery: Private Pilot* (2018) (This course uses instructional materials approved or required by the associated industry and/or certifying organizations. As those standards or assessments are updated, instructional materials will update accordingly.)
Essential Equipment:	Flight simulators and peripherals, simulator software
Reference Materials:	https://www.faa.gov/regulations_policies/handbooks_manuals/aviation https://www.faa.gov/training_testing/testing/acs/media/private_airplane_acs_change_1.pdf
Supplies:	


Fairbanks North Star Borough School District