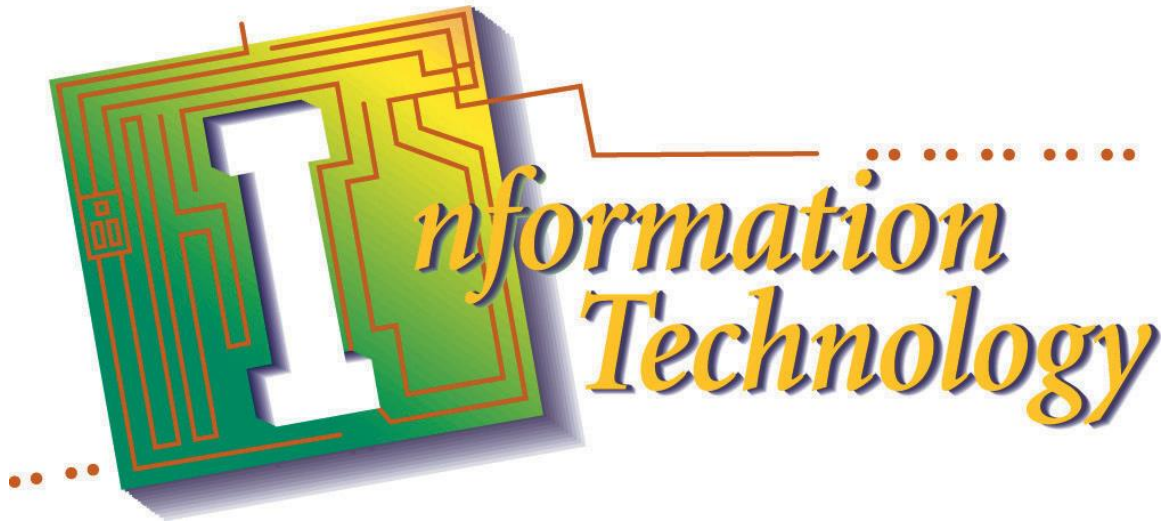
Fairbanks North Star Borough School District

Career & Technical Education Curriculum



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Acknowledgements

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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
FNSBSD	Fairbanks North Star Borough School District
IT	Information Technology
NBEA	National Business Education Association
NICE	National Initiative for Cybersecurity Education
OSHA	Occupational Safety and Health Administration
PLCP	Personal Learning and Career Plan
PLTW	Project Lead the Way
RPC	Recognized Post-secondary Credential
STEL	Standards for Technological and Engineering Literacy
TSA	Technology Student Association
UAA	University of Alaska - Anchorage
UAF	University of Alaska – Fairbanks
USDOL	United States Department of Labor
WS	Writing Standards

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.

Information Technology Overview

The Information Technology (IT) cluster includes building linkages in IT occupations for entry level, technical, and professional careers related to the design, development, support, and management of hardware, software, multimedia, and systems integration services.

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

<table>
<tr><th colspan="8">Information Technology Overview</th></tr>
<tr><th>Grade 7</th><th>Grade 8</th><th>Grade 9</th><th>Grade 10</th><th>Grade 11</th><th>Grade 12</th><th>Grade 13</th><th>Grade 14</th></tr>
<tr><td colspan="2">Middle School</td><td>Introductory</td><td colspan="2">Concentrator Courses</td><td>Capstone Courses</td><td colspan="2">Post-Secondary</td></tr>
<tr><td>App Creators</td><td>Computer Science for Innovators & Makers</td><td rowspan="2">Computer Essentials 1A/1B</td><td rowspan="2">Computer Science Principles 1A/1B

IT Networking</td><td rowspan="2">Computer Science 1A/1B</td><td rowspan="2">Cybersecurity 1A/1B</td><td rowspan="2"></td><td rowspan="2"></td></tr>
<tr><td colspan="2">For more middle school course options, see the CTE STEM curriculum.</td></tr>
<tr><td colspan="8">Various certifications are available through the pathway. Check specific course objectives.</td></tr>
</table>

Certification Options			
Course	**Certification**	**Issuing Organization**	**Course or Exam Restrictions**
IT Networking*	Network+	CompTIA	
Cybersecurity 1B*	Security+	CompTIA	
*Denotes exam offered by the FNSBSD during or at the end of the course.			

Career & Technical Education

Information Technology

Middle School Courses

App Creators 1A/1B

COURSE INFORMATION	
Course Name:	App Creators 1A/1B
Course Number:	CTE98 & CTE99
Grade(s):	6-8
Length (# of semesters):	2 semesters
Credit:	n/a
Foundational Course:	☐ This is a foundational CTE course (foundational courses are not technical)
Prerequisites:	None
Sequence or CTEPS:	Information Technology
Date of District Course Revision:	Spring 2022
CAREER & TECHNICAL STUDENT ORGANIZATION (CTSO)	
CTSO Embedded in this Sequence:	Technology Student Association (TSA)
TECHNICAL/OCCUPATIONAL STANDARDS	
Source(s) of Technical Standards:	Standards for Technological and Engineering Literacy
Names/Numbers of Technical Standards:	STEL 1J – STEL 7V
REGISTRATION INFORMATION	
Course Description: (Brief paragraph - as will be shown in the student course catalog)	Students learn and apply computational thinking and technical knowledge and skills to create mobile apps. They also acquire and apply skills pertaining to the design process, problem solving, persistence, collaboration, and communication.
Instructional Topic Headings: (Separate each heading with a semi-colon.)	Let's Create and App; Taking it to the Next Level (Using algorithms to store and manipulate data); The App Challenge (Create an app to solve a personal or community problem)
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)*	n/a
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:	State of Alaska Employability Standards
DUAL CREDIT AGREEMENT	
CTSO participation is included:	No
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:	Joni Simpson
Course Adapted From:	Project Lead the Way
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**	**Alaska Computer Science Standards**	**Employability/ Career Readiness Standards**	**Assessment**
Students will create an app	STEL-1J-3.2 STEL-2M.2.1 STEL-2S.3.2 STEL-7 Q.1.52.4, 3.2 STEL-7R.3.2 STEL-7S.3.2	RI.6-8.1-3 RI.6-8.4-7 RI.6-8.8-10 W.6-8.1.a-e W.6-8.2.a,c SL.6-8.1.a-d L.6-8.1.a-e L.6-8.2.a-c L.6-8.3.a-b L.6-8.4.a-d L.6-8.5.a-c L.6-8.6.6	6EE-8EE 1,2,3,4 5-8 (7&8) 6SP 5-7, 7SP 4 &5 8F.1 , F.2	MS-ETS1-2, 1.5, 2.4, 3.2 P1 3.13.2 P6 1.5 3.13.2, P.5,1.2, 1.5, 2.12.22.32. 4, 3.13.2 P7 3.13.2 P8 1.5, 2.12.22.32. 4, 3.13.2	A1 B1-4 C1 & 4 D5	2-8CS.D.01 2-8CS.HS.01 L2.CS.HS.01 6-8.CS.T.01 6-8.NI.NCO.01 6-8.DA.S.01 6-8.DA.IM.01 6-8.AP.A.01 L1.AP.A.01 U 6.-8AP.V.01 D K.AP.PD.01-04 1.AP.PD.01-04 6.AP.PD.05 7.AP.PD.01-05 K.CGEI.C.01 through 8.CGEI.C.01 K.CGEI.SI.01 through 5.CGEI.SI.0 K.CGEI.SLE.01 through 8..CGEI.SLE.01	A1, 2 & 6 B1	Successful completion of an APP evaluate process
Students will use math and science algorithms to manipulate and save data	STEL-1J-3.2 STEL-2M.2.1 STEL-2S.3.2 STEL-7 Q.1.52.4, 3.2 STEL-7R.3.2 STEL-7S.3.2	RI.6-8.1-3 RI.6-8.4-7 RI.6-8.8-10 W.6-8.1.a-e W.6-8.2.a,cd W.6-8.4-10 SL.6-8.1.a-d L.6-8.1.a-e L.6-8.2.a-c L.6-8.3.a-b L.6-8.4.a-d L.6-8.5.a-c L.6-8.6.6	6EE-8EE 1,2,3,4 5-8 (7&8) 6SP 5-7, 7SP 4 &5 8F.1 , F.2	MS-ETS1-2, 1.5, 2.4, 3.2 P1 3.13.2 P6 1.5 3.13.2, P.5,1.2, 1.5, 2.12.22.32. 4, 3.13.2 P7 3.13.2 P8 1.5, 2.12.22.32. 4, 3.13.2	A1 B1-4 C1 & 4 D5	2-8CS.D.01 2-8CS.HS.01 L2.CS.HS.01 6-8.CS.T.01 6-8.NI.NCO.01 6-8.DA.S.01 6-8.DA.IM.01 6-8.AP.A.01 L1.AP.A.01 U 6.-8AP.V.01 D K.AP.PD.01-04 1.AP.PD.01-04 6.AP.PD.05 7.AP.PD.01-05 K.CGEI.C.01 through 8.CGEI.C.01 K.CGEI.SI.01 through 5.CGEI.SI.0 K.CGEI.SLE.01 through 8..CGEI.SLE.01	A1, 2 & 6 B1	Demonstration and quizzes

Student Performance Standards (Instructional Topic Headings)	Specific Technical Skills Standards	Alaska English/ Language Arts Standards	Alaska Math Standards	Alaska Science Standards	Alaska Cultural Standards	Alaska Computer Science Standards	Employability/ Career Readiness Standards	Assessment
Students will use the skills they learned and developed to create an app that will solve a personal or community problem.	STEL-1 J-3.2 STEL-2 M.2.1 STEL-2S.3.2 STEL-7 Q.1.52.4, 3.2 STEL-7 R.3.2 STEL-7 S.3.2 STEL-7 U.1.5, 2.4, 3.2 STEL-7 V.1.5, 2.4, 3.2	RI.6-8.1-3 RI.6-8.4-7 RI.6-8.8-10 W.6-8.1.a-e W.6-8.2.a,cd W.6-8.4-10 SL.6-8.1.a-d L.6-8.1.a-e L.6-8.2.a-c L.6-8.3.a-b L.6-8.4.a-d L.6-8.5.a-c L.6-8.6.6	6EE-8EE 1,2,3,4 5-8 (7&8) 6SP 5-7, 7SP 4 &5 8F.1 , F.2	MS-ETS1-2, 1.5, 2.4, 3.2 P1 3.13.2 P6 1.5 3.13.2, P.5,1.2, 1.5, 2.12.22.32. 4, 3.13.2 P7 3.13.2 P8 1.5, 2.12.22.32. 4, 3.13.2	A1 B1-4 C1 & 4 D5	2-8CS.D.01 2-8CS.HS.01 L2.CS.HS.01 6-8.CS.T.01 6-8.NI.NCO.01 6-8.DA.S.01 6-8.DA.IM.01 6-8.AP.A.01 L1.AP.A.01 U 6.-8AP.V.01 D K.AP.PD.01-04 1.AP.PD.01-04 6.AP.PD.05 7.AP.PD.01-05 K.CGEI.C.01 through 8.CGEI.C.01 K.CGEI.SI.01 through 5.CGEI.SI.0 K.CGEI.SLE.01 through 8..CGEI.SLE.01	A1, 2 & 6 B1	Project evaluation

INSTRUCTIONAL RESOURCES	
List the major instructional resources used for this course:	
Websites:	Project Lead the Way (PLTW) - https://www.pltw.org
Textbooks:	PLTW materials
Essential Equipment:	Computer
Reference Materials:	PLTW materials provided
Supplies:	Computer

Computer Science for Innovator and Makers 1A/1B

COURSE INFORMATION	
Course Name:	Computer Science for Innovator and Makers
Course Number:	CTE90 & CTE95
Grade(s):	6-8
Length (# of semesters):	2 semesters
Credit:	n/a
Foundational Course:	☐ This is a foundational CTE course (foundational courses are not technical)
Prerequisites:	None
Sequence or CTEPS:	Information Technology
Date of District Course Revision:	Spring 2022
CAREER & TECHNICAL STUDENT ORGANIZATION (CTSO)	
CTSO Embedded in this Sequence:	Technology Student Association (TSA)
TECHNICAL/OCCUPATIONAL STANDARDS	
Source(s) of Technical Standards:	Standards for Technological and Engineering Literacy
Names/Numbers of Technical Standards:	STEL 1J – STEL 7V
REGISTRATION INFORMATION	
Course Description: (Brief paragraph - as will be shown in the student course catalog)	Have you ever wondered how code can be used in wearable technology, art exhibits, or mechanical devices? In *Computer Science for Innovator and* Makers, students learn about programming for the physical world by blending hardware design and software development. Using microcontrollers with inputs and outputs, they develop code that brings their physical designs to life. It's time to become an innovator and maker using physical computing!
Instructional Topic Headings: (Separate each heading with a semi-colon.)	Blink (Parts of a Computer and Block-Based Coding); The Ins & Outs (Sensors, Switches & Micro-controllers); Program the Physical World (Collaborative Project)
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)*	n/a

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:	State of Alaska Employability Standards
DUAL CREDIT AGREEMENT	
CTSO participation is included:	No
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:	Joni Simpson
Course Adapted From:	Project Lead the Way
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**	**Alaska Computer Science Standards**	**Employability/ Career Readiness Standards**	**Assessment**
Students will demonstrate knowledge of all the parts of a computer and what they do.	STEL-1J-3.2 STEL-2M.2.1	RI.6-8.1-3; RI.6-8.4-7 RI.6-8.8-10; W.6-8.1.a-e; W.6-8.2.a,c SL.6-8.1.a-d; L.6-8.1.a-e; L.6-8.2.a-c L.6-8.3.a-b; L.6-8.4.a-d; L.6-8.5.a-c L.6-8.6.6		MS-ETS1-2, 1.5, 2.4, 3.2 P1 3.13.2 P6 1.5, 13.2 P8, 2.12.22.32.4, 3.13.2	A1	2-8CS.D.01 2-8CS.HS.01 L2.CS.HS.01	A1, 2 & 6 B1	Demonstration and quizzes
Students will learn and create projects using block-based coding	STEL-1J-3.2 STEL-2M.2.1 STEL-2S.3.2 STEL-7 Q.1.52.4, 3.2 STEL-7R.3.2 STEL-7S.3.2	RI.6-8.1-3; RI.6-8.4-7 RI.6-8.8-10; W.6-8.1.a-e; W.6-8.2.a,cd W.6-8.4-10; SL.6-8.1.a-d; L.6-8.1.a-e L.6-8.2.a-c; L.6-8.3.a-b; L.6-8.4.a-d L.6-8.5.a-c; L.6-8.6.6	6EE-8EE 1,2,3,4 5-8 (7&8) 6SP 5-7, 7SP 4 &5 8F.1 , F.2	MS-ETS1-2, 1.5, 2.4, 3.2 P1 3.13.2 P6 1.5 3.13.2, P.5,1.2, 1.5, 2.12.22.32. 4, 3.13.2 P7 3.13.2 P8 1.5, 2.12.22.32. 4, 3.13.2	A1 B1-4 C1 & 4 D5	2-8CS.D.01 2-8CS.HS.01 L2.CS.HS.01 6-8.CS.T.01 6-8.NI.NCO.01 6-8.DA.S.01 6-8.DA.IM.01 6-8.AP.A.01 L1.AP.A.01 U 6.-8AP.V.01 D K.AP.PD.01-04 1.AP.PD.01-04 6.AP.PD.05 7.AP.PD.01-05 K.CGEI.C.01 through 8.CGEI.C.01 K.CGEI.SI.01 through 5.CGEI.SI.0 K.CGEI.SLE.01 through 8..CGEI.SLE.01	A1, 2 & 6 B1	Demonstration and project completion

Student Performance Standards (Instructional Topic Headings)	Specific Technical Skills Standards	Alaska English/ Language Arts Standards	Alaska Math Standards	Alaska Science Standards	Alaska Cultural Standard	Alaska Computer Science Standards	Employability/ Career Readiness Standards	Assessment
Students will develop competency wiring switches to microcontrollers to run a programs they develop.	STEL-1J-3.2 STEL-2M.2.1 STEL-2S.3.2 STEL-7Q.1.52.4, 3.2 STEL-7R.3.2 STEL-7S.3.2	RI.6-8.1-3; RI.6-8.4-7 RI.6-8.8-10; W.6-8.1.a-e; W.6-8.2.a,cd W.6-8.4-10; SL.6-8.1.a-d; L.6-8.1.a-e L.6-8.2.a-c; L.6-8.3.a-bL.6-8.4.a-d L.6-8.5.a-c L.6-8.6.6	6EE-8EE 1,2,3,4 5-8 (7&8) 6SP 5-7, 7SP 4 &5 8F.1 , F.2	MS-ETS1-2, 1.5, 2.4, 3.2 P1 3.13.2 P6 1.5 3.13.2, P.5,1.2, 1.5, 2.12.22.32. 4, 3.13.2 P7 3.13.2 P8 1.5, 2.12.22.32. 4, 3.13.2	A1 B1-4 C1 & 4 D5	2-8CS.D.01 2-8CS.HS.01 L2.CS.HS.01 6-8.CS.T.01 6-8.NI.NCO.01 6-8.DA.S.01 6-8.DA.IM.01 6-8.AP.A.01 L1.AP.A.01 U 6.-8AP.V.01 D K.AP.PD.01-04 1.AP.PD.01-04 6.AP.PD.05 7.AP.PD.01-05 K.CGEI.C.01 through 8.CGEI.C.01 K.CGEI.SI.01 through 5.CGEI.SI.0 K.CGEI.SLE.01 through 8..CGEI.SLE.01	A1, 2 & 6 B1	

Student Performance Standards (Instructional Topic Headings)	Specific Technical Skills Standards	Alaska English/ Language Arts Standards	Alaska Math Standards	Alaska Science Standards	Alaska Cultural Standard	Alaska Computer Science Standards	Employability/ Career Readiness Standards	Assessment
Students will use skills learned and developed to solve a collaborative problem.	STEL-1J-3.2 STEL-2M.2.1 STEL-2S.3.2 STEL-7Q.1.52.4, 3.2 STEL-7R.3.2 STEL-7S.3.2 STEL-7U.1.5, 2.4, 3.2 STEL-7V.1.5, 2.4, 3.2	RI.6-8.1-3; RI.6-8.4-7 RI.6-8.8-10; W.6-8.1.a-e; W.6-8.2.a,cd W.6-8.4-10; SL.6-8.1.a-d; L.6-8.1.a-e L.6-8.2.a-c; L.6-8.3.a-b; L.6-8.4.a-d L.6-8.5.a-c; L.6-8.6.6	6EE-8EE 1,2,3,4 5-8 (7&8) 6SP 5-7, 7SP 4 &5 8F.1 , F.2	MS-ETS1-2, 1.5, 2.4, 3.2 P1 3.13.2 P6 1.5 3.13.2, P.5,1.2, 1.5, 2.12.22.32. 4, 3.13.2 P7 3.13.2 P8 1.5, 2.12.22.32. 4, 3.13.2	A1 B1-4 C1 & 4 D5	6-8CS.D.o1 6-8CS.HS.01 L2.CS.HS.01 6-8.CS.T.01 6-8.NI.NCO.01 6-8.DA.S.01 6-8.DA.IM.01 6-8.AP.A.01 L1.AP.A.01 U 6.-8AP.V.01 D K.AP.PD.01-04 1.AP.PD.01-04 6.AP.PD.05 7.AP.PD.01-05 K.CGEI.C.01 through 8.CGEI.C.01 K.CGEI.SI.01 through 5.CGEI.SI.0 K.CGEI.SLE.01 through 8..CGEI.SLE.01	A1, 2 & 6	

INSTRUCTIONAL RESOURCES	
List the major instructional resources used for this course:	
Websites:	Project Lead the Way (PLTW) - https://www.pltw.org
Textbooks:	PLTW materials
Essential Equipment:	Computer
Reference Materials:	PLTW materials provided
Supplies:	Computer

Career & Technical Education

Information Technology

High School Courses

Computer Essentials 1A

COURSE INFORMATION	
Course Name:	Computer Essentials 1A
Course Number:	CTEF207
Grade(s):	9-12
Length (# of semesters):	One semester
Credit:	0.5
Foundational Course:	☐ This is a foundational CTE course (foundational courses are not technical)
Prerequisites:	None
Sequence or CTEPS:	Information Technology
Date of District Course Revision:	Spring 2022
CAREER & TECHNICAL STUDENT ORGANIZATION (CTSO)	
CTSO Embedded in this Sequence:	Technology Student Association (TSA)
TECHNICAL/OCCUPATIONAL STANDARDS	
Source(s) of Technical Standards:	Standards for Technological and Engineering Literacy
Names/Numbers of Technical Standards:	STEL-1 – STEL-8
REGISTRATION INFORMATION	
Course Description: (Brief paragraph - as will be shown in the student course catalog)	*Computer Essentials 1A* introduces students to coding fundamentals through an approachable, block-based programming language where they will have early success in creating usable apps. As students sharpen their computational thinking skills, they will transition to programming environments that reinforce coding fundamentals by displaying block programming and text-based programming side-by-side. Finally, students will learn the power of text-based programming as they are introduced to the Python® programming language. The course engages students in computational thinking practices and collaboration strategies, as well as industry standard tools authentic to how computer science professionals work. Students will learn about professional opportunities in computer science and how computing can be an integral part of all careers today. This is a Project Lead the Way (PLTW) course. PLTW courses require specialized instructor training and the use of PLTW curriculum and materials. As such, this course may not be taught at schools without prior district approval. Contact CTE and/or Teaching and Learning for more information.

Instructional Topic Headings: (Separate each heading with a semi-colon.)	Introduction to Computer Science Essentials; Collaborating around Computing; Innovation and Problem Solving; Computing and Society: Transition to Text; Computing and Career in our Society; Computing and our World
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)*	Project Lead the Way's (PLTW) End-of-Course Assessments
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
DUAL CREDIT AGREEMENT	
CTSO participation is included:	No
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:	Joni Simpson
Course Adapted From:	Project Lead the Way
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**
Mobile computing has changed our world, and many of today's students have never known a life without apps. This lesson gives students the tools they need to create their own apps using MIT App Inventor. The goal of this lesson is to introduce students to coding fundamentals through block-based programming. Students will develop independent and collaborative strategies that will help them communicate around computing as they learn and reinforce the fundamental concepts of coding. With a powerful yet approachable tool, students will use their creativity to produce computational artifacts like those that are essential to all of us today.	STEL-2Y, STEL-2Z, STEL-7W, STEL-7Z, STEL-7CC, STEL-8N	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1, A-SSE.2, A-SSE.3, A-REI.1, F-LE.1, F-IF.8, F-IF.9, F-LE.1, S-IC.1-6, S-CP.1, S-IC.5, S-CP.2, S-CP.3, S-CP.4, S-CP.5, S-ID.1-6	HS-PS1-1, HS-PS1-2, HS-PS1-4, HS-PS1-6, HS-PS1-7, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Activities, Projects, and quizzes
The focus is on collaborative strategies that coding professionals use when creating programs and applications, while it continues to introduce essential concepts in computer science and coding. The lesson also introduces the idea that computer science can be more than just innovation and creative expression; it can be powerful in trying to solve many problems in today's world. Students apply an Agile development process and task decomposition to solve a problem that meets the needs of others.	STEL-1N, STEL-1Q, STEL-2Y, STEL-2Z, STEL-7W, STEL-7Z, STEL-7CC, STEL-8N	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6), F-IF.9, F-BF.1, F-LE.1(2), S-IC.1, S-CP.2(3,4,5)	HS-PS1-1, HS-PS1-4, HS-PS1-6, HS-PS1-7, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Solve problems and challenges.

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
This unit gives students the freedom to select the focus of their development in choosing the type of app they would like to collaborate to create. Student groups will apply development strategies and user-centered research to create an app that has value to others. Students will gain insight on the importance of creativity, persistence, and value of diverse perspectives in an iterative development process.	STEL-1N, STEL-1Q, STEL-2Y, STEL-2Z, STEL-7W, STEL-7Z, STEL-7CC, STEL-8N	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4) A-REI.1, F-IF.1 (2,3,4,5,6), F-IF.9, F-BF.1, F-LE.1(2), S-IC.1, S-CP.2(3,4,5)	HS-PS1-3 HS-PS1-4 HS-PS1-6 HS-PS1-7 HS-PS1-8 HS-PS2-1 HS-PS2-2 HS-PS2-3 HS-PS2-4 HS-PS3-3 HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Creation and development of app.
Block-based programming is a great way to introduce coding fundamentals, but many students want to know, “What is happening inside those blocks?” This introduces students to the idea of a lower level of abstraction in a programming language. Students will develop in an environment that allows them to create in blocks, but see that same code in a text-based language.	STEL-2Y, STEL-2Z, STEL-7W, STEL-7Z, STEL-7CC, STEL-8N	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4) A-REI.1, F-IF.1 (2,3,4,5,6), F-IF.9, F-BF.1, F-LE.1(2), S-IC.1, S-CP.2(3,4,5)	HS-PS1-3 HS-PS1-4 HS-PS1-6 HS-PS1-7 HS-PS1-8 HS-PS2-1 HS-PS2-2 HS-PS2-3 HS-PS2-4 HS-PS3-3 HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Resolution of problem
Just as clicks of a button or “swipes” of a screen are used to trigger events in an app, today, images are becoming increasingly important as a way to make decisions in programming. In this lesson, students will explore image processing and other innovations that are changing our society. Students will also begin to investigate the wide range of careers in computer science, and how computational thinking is an important part of the majority of professions today and in the future.	STEL-1N, STEL-1Q, STEL-2Y, STEL-2Z, STEL-3I, STEL-4P, STEL-5H, STEL-5I, STEL-6H, STEL-7W, STEL-7Z, STEL-7CC, STEL-8N	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	A-REI.1	HS-PS1-3, HS-PS1-4, HS-PS1-6, HS-PS1-7, HS-PS2-1, HS-PS2-2	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Application problems

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
Tomorrow's solutions involve all of us. In the final lesson, student groups will learn how to take collaborations to scale to achieve a common goal through a variety of projects and challenges.	STEL-2Y, STEL-2Z, STEL-7W, STEL-7Z, STEL-7CC, STEL-8N	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6), F-IF.9, F-BF.1, F-LE.1(2), S-C.1(2,3,4,5,6) S-CP.2(3,4,5)	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-5, HS-PS1-6, HS-PS1-7, HS-PS1-8, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS2-5, HS-PS3-1, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Application problems and challenge resolution

INSTRUCTIONAL RESOURCES	
List the major instructional resources used for this course:	
Websites:	Project Lead the Way (PLTW) - https://www.pltw.org
Textbooks:	PLTW materials
Essential Equipment:	Computer
Reference Materials:	PLTW materials provided
Supplies:	Computer

Computer Essentials 1B

COURSE INFORMATION	
Course Name:	Computer Essentials 1B
Course Number:	CTEF208
Grade(s):	9-12
Length (# of semesters):	One semester
Credit:	0.5
Foundational Course:	☐ This is a foundational CTE course (foundational courses are not technical)
Prerequisites:	*Computer Essentials 1A*
Sequence or CTEPS:	Information Technology
Date of District Course Revision:	Spring 2022
CAREER & TECHNICAL STUDENT ORGANIZATION (CTSO)	
CTSO Embedded in this Sequence:	Technology Student Association (TSA)
TECHNICAL/OCCUPATIONAL STANDARDS	
Source(s) of Technical Standards:	Standards for Technological and Engineering Literacy
Names/Numbers of Technical Standards:	STEL-1 – STEL-8
REGISTRATION INFORMATION	
Course Description: (Brief paragraph - as will be shown in the student course catalog)	In *Computer Essentials 1B,* students will continue to learn coding fundamentals through an approachable, block-based programming language where they will have early success in creating usable apps. As students sharpen their computational thinking skills, they will transition to programming environments that reinforce coding fundamentals by displaying block programming and text-based programming side-by-side. Finally, students will learn the power of text-based programming as they are introduced to the Python® programming language. The course engages students in computational thinking practices and collaboration strategies, as well as industry standard tools authentic to how computer science professionals work. Students will learn about professional opportunities in computer science, and how computing can be an integral part of all careers today. This is a Project Lead the Way (PLTW) course. PLTW courses require specialized instructor training and the use of PLTW curriculum and materials. As such, this course may not be taught at schools without prior district approval. Contact CTE and/or Teaching and Learning for more information.

Instructional Topic Headings: (Separate each heading with a semi-colon.)	Text-based Coding; Text-based Solutions; The Power of Text-based Programming; Innovation of Computational Problem Solving
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)*	Project Lead the Way's (PLTW) End-of-Course Assessments
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
DUAL CREDIT AGREEMENT	
CTSO participation is included:	No
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:	Joni Simpson
Course Adapted From:	Project Lead the Way
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 reinforce previously learned concepts as they are introduced to the power of programming in a text-based language. The goal of this lesson is for students to become comfortable implementing algorithms using conditionals and loops in Python.	STEL-2Y, STEL-2Z, STEL-7W, STEL-7Z, STEL-7CC, STEL-8N	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1, A-SSE.2, A-SSE.3, A-REI.1, F-LE.1, F-IF.8, F-IF.9, F-LE.1, S-IC.1-6, S-CP.1, S-IC.5, S-CP.2, S-CP.3, S-CP.4, S-CP.5, S-ID.1-6	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-6, HS-PS1-7, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Activities, projects, and quizzes
Students will continue to explore the use of text-based programming. The lesson ends with students creating a game simulation that allows them to make generalizations and develop functions that attempt to detect and react to another team's strategy	STEL-1N, STEL-1Q, STEL-2Y, STEL-2Z, STEL-7W, STEL-7Z, STEL-7CC, STEL-8N	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6), F-IF.9, F-BF.1, F-LE.1(2), S-IC.1, S-CP.2(3,4,5)	HS-PS1-1, HS-PS1-4, HS-PS1-6, HS-PS1-7, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Evaluate game and solve problems

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 work with a team to create a program that automates the solution of a problem from one of their other classes.	STEL-1N, STEL-1Q, STEL-2Y, STEL-2Z, STEL-7W, STEL-7Z, STEL-7CC, STEL-8N	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6), F-IF.9, F-BF.1, F-LE.1(2), S-IC.1, S-CP.2(3,4,5)	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-5, HS-PS1-6, HS-PS1-7, HS-PS1-8, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS2-5, HS-PS3-1, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Evaluation of project
Students will have the opportunity to apply the collaboration, technical, and communication skills that they have developed to solve an authentic problem that is relevant to them.	STEL-2Y, STEL-2Z, STEL-7W, STEL-7Z, STEL-7CC, STEL-8N	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6), F-IF.9, F-BF.1, F-LE.1(2), S-IC.1, S-CP.2(3,4,5)	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-5, HS-PS1-6, HS-PS1-7, HS-PS1-8, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS2-5, HS-PS3-1, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Evaluation of a semester long project

INSTRUCTIONAL RESOURCES	
List the major instructional resources used for this course:	
Websites:	Project Lead the Way (PLTW) - https://www.pltw.org
Textbooks:	PLTW materials
Essential Equipment:	Computer
Reference Materials:	PLTW materials provided
Supplies:	Computer

Computer Science 1A

COURSE INFORMATION	
Course Name:	Computer Science 1A
Course Number:	CTEF209
Grade(s):	9-12
Length (# of semesters):	One semester
Credit:	0.5
Foundational Course:	☐ This is a foundational CTE course (foundational courses are not technical)
Prerequisites:	*Computer Essentials 1A/1B* or *Computer Science Principles 1A/1B* or permission from instructor
Sequence or CTEPS:	Information Technology
Date of District Course Revision:	Spring 2022
CAREER & TECHNICAL STUDENT ORGANIZATION (CTSO)	
CTSO Embedded in this Sequence:	Technology Student Association (TSA)
TECHNICAL/OCCUPATIONAL STANDARDS	
Source(s) of Technical Standards:	Standards for Technological and Engineering Literacy
Names/Numbers of Technical Standards:	STEL-1P – STEL-8R
REGISTRATION INFORMATION	
Course Description: (Brief paragraph - as will be shown in the student course catalog)	*Computer Science 1A* includes structured lab experiences to engage students in individual or group problem solving. Thus, it includes a substantial lab component in which students design solutions to problems, express their solutions precisely (e.g., in the Java programming language), test their solutions, identify and correct errors, and compare possible solutions. This is a Project Lead the Way (PLTW) course. PLTW courses require specialized instructor training and the use of PLTW curriculum and materials. As such, this course may not be taught at schools without prior district approval. Contact CTE and/or Teaching and Learning for more information.
Instructional Topic Headings: (Separate each heading with a semi-colon.)	Primitive Types of Data; Using Objects; Boolean Expressions and if Statements; Iteration, Writing Classes, Problem Solving

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)*	Project Lead the Way's (PLTW) End-of-Course Assessments
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
DUAL CREDIT AGREEMENT	
CTSO participation is included:	No
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:	Joni Simpson
Course Adapted From:	Project Lead the Way
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**
Variables are used to store data within a computer. One category of data that can be stored in a variable is primitive data. In this unit, students are introduced to three of the primitive data types defined in Java™. They learn how to create variables to store values of these different data types and the basic operations that can be performed on them. Students also learn how to output data using a basic form of output through the System.out object.	STEL-1Q, STEL-1R, STEL-2U, STEL-2X, STEL-2Y, STEL-2Z, STEL-3H, STEL-7AA, STEL-7BB, STEL-7CC, STEL-7DD, STEL-8N, STEL-8P	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6,7,8,9) F-BF.1(2,3,4), F-LE.1(2,3,4,5), S-IC.1, S-CP.2 (3,4,5), S-MD.1 (2,3,4,5,6,7)	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-6, HS-PS1-7, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Activities, projects, and quizzes
Students will be introduced to a new type of data: reference data. Reference data allows real-world objects to be represented in varying degrees specific to a programmer's purpose. This unit builds on students' ability to write expressions by introducing them to Math class methods to write expressions for generating random numbers and other more complex operations. In addition, strings and the existing methods within the String class are an important topic within this unit. Knowing how to declare variables or call methods on objects is necessary throughout the course.	STEL-2T, STEL-2U, STEL-2V, STEL-2X, STEL-2Y, STEL-2Z, STEL-7Z, STEL-7AA, STEL-7BB, STEL-7CC, STEL-7DD	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6,7,8,9) F-BF.1(2,3,4), F-LE.1(2,3,4,5), S-IC.1, S-CP.2 (3,4,5), S-MD.1 (2,3,4,5,6,7)	HS-PS1-1, HS-PS1-4, HS-PS1-6, HS-PS1-7, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Activities, projects, and quizzes

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
Algorithms are composed of three building blocks: sequencing, selection, and iteration. This unit focuses on selection, which is represented in a program by using conditional statements. Conditional statements give the program the ability to decide and respond appropriately, and are a critical aspect of any nontrivial computer program. In addition to learning the syntax and proper use of conditional statements, students will build on the introduction of Boolean variables by writing Boolean expressions with relational and logical operators.	STEL-1Q, STEL-2Y, STEL-2Z, STEL-7W, STEL-7X, STEL-7Y, STEL-7AA, STEL-7BB, STEL-7CC, STEL-7DD	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6), F-IF.9, F-BF.1, F-LE.1(2), S-IC.1, S-CP.2 (3,4,5)	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-5, HS-PS1-6, HS-PS1-7, HS-PS1-8, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS2-5, HS-PS3-1, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Activities, projects, and quizzes
Students will implement everything they have learned to design, plan, and collaboratively develop a solution that completes the functionality of a provided Escape Room style game.	STEL-1Q, STEL-2T, STEL-2Y, STEL-2Z, STEL-7W, STEL-7Y, STEL-7Z, STEL-7AA, STEL-7BB, STEL-7CC, STEL-7DD	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6,7,8,9) F-BF.1(2,3,4), F-LE.1(2,3,4,5), S-IC.1, S-CP.2 (3,4,5), S-MD.1 (2,3,4,5,6,7)	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-5, HS-PS1-6, HS-PS1-7, HS-PS1-8, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS2-5, HS-PS3-1, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Quizzes and problem evaluation

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 be introduced to several standard algorithms that use iteration. Knowledge of standard algorithms makes solving similar problems easier, as algorithms can be modified or combined to suit new situations. Iteration is used when traversing data structures such as arrays, ArrayLists, and 2D arrays.	STEL-1P, STEL-1Q, STEL-1R, STEL-2T, STEL-2V, STEL-2W, STEL-2X, STEL-2Y, STEL-2Z, STEL-3H, STEL-3I, STEL-3J, STEL-4P, STEL-4S, STEL-4T, STEL-5I, STEL-6J, STEL-6H, STEL-7Y, STEL-7Z, STEL-7AA, STEL-7CC, STEL-7DD, STEL-8N, STEL-8O, STEL-8P, STEL-8Q, STEL-8R	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6,7,8,9) F-BF.1(2,3,4), F-LE.1(2,3,4,5), S-IC.1, S-CP.2 (3,4,5), S-MD.1 (2,3,4,5,6,7)	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-5, HS-PS1-6, HS-PS1-7, HS-PS1-8, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS2-5, HS-PS3-1, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Activities, projects, and quizzes
This unit will pull together information from all previous units to create new, user-defined reference data types in the form of classes. The ability to accurately model real-world entities in a computer program is a large part of what makes computer science so powerful. This unit focuses on identifying appropriate behaviors and attributes of real world entities and organizing these into classes. The creation of computer programs can have extensive impacts on societies, economies, and cultures. The legal and ethical concerns that come with programs and the responsibilities of programmers are also addressed in this unit.	STEL-4T, STEL-5, STEL-6F, STEL-6G, STEL-6H, STEL-7W, STEL-7Y, STEL-7AA, STEL-7BB, STEL-7CC, STEL-7DD	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6), F-IF.9, F-BF.1, F-LE.1(2), S-IC.1, S-CP.2 (3,4,5)	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-5, HS-PS1-6, HS-PS1-7, HS-PS1-8, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS2-5, HS-PS3-1, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Evaluation of project

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
At the end of this chapter, students will implement everything they have learned to design, plan, and collaboratively develop an ad system for a social media site to help people sell their pet food or some similar project.	STEL-1P, STEL-1Q, STEL-1R, STEL-2T, STEL-2V, STEL-2W, STEL-2X, STEL-2Y, STEL-2Z, STEL-3H, STEL-3I, STEL-3J, STEL-4P, STEL-4S, STEL-4T, STEL-5I, STEL-6J, STEL-6H, STEL-7Y,STEL-7Z, STEL-7AA, STEL-7CC, STEL-7DD, STEL-8N, STEL-8O, STEL-8P, STEL-8Q, STEL-8R	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6,7,8,9) F-BF.1(2,3,4), F-LE.1(2,3,4,5), S-IC.1, S-CP.2 (3,4,5), S-MD.1 (2,3,4,5,6,7)	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-5, HS-PS1-6, HS-PS1-7, HS-PS1-8, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS2-5, HS-PS3-1, HS-PS3-3, HS-PS3-5	A.1 B.2 B.3 B.4	A.1 A.2 A.5 A.6	Evaluation of project

INSTRUCTIONAL RESOURCES	
List the major instructional resources used for this course:	
Websites:	Project Lead the Way (PLTW) - https://www.pltw.org
Textbooks:	PLTW materials
Essential Equipment:	Computer
Reference Materials:	PLTW materials provided
Supplies:	Computer

Computer Science 1B

COURSE INFORMATION	
Course Name:	Computer Science 1B
Course Number:	CTEF210
Grade(s):	9-12
Length (# of semesters):	One semester
Credit:	0.5
Foundational Course:	☐ This is a foundational CTE course (foundational courses are not technical)
Prerequisites:	*Computer Science 1A* or permission from instructor
Sequence or CTEPS:	Information Technology
Date of District Course Revision:	Spring 2022
CAREER & TECHNICAL STUDENT ORGANIZATION (CTSO)	
CTSO Embedded in this Sequence:	Technology Student Association (TSA)
TECHNICAL/OCCUPATIONAL STANDARDS	
Source(s) of Technical Standards:	Standards for Technological and Engineering Literacy
Names/Numbers of Technical Standards:	STEL-1P – STEL-8R
REGISTRATION INFORMATION	
Course Description: (Brief paragraph - as will be shown in the student course catalog)	*Computer Science 1B* includes structured lab experiences to engage students in individual or group problem solving. Thus, it includes a substantial lab component in which students design solutions to problems, express their solutions precisely (e.g., in the Java programming language), test their solutions, identify and correct errors, and compare possible solutions. This is a Project Lead the Way (PLTW) course. PLTW courses require specialized instructor training and the use of PLTW curriculum and materials. As such, this course may not be taught at schools without prior district approval. Contact CTE and/or Teaching and Learning for more information.
Instructional Topic Headings: (Separate each heading with a semi-colon.)	Arrays; Array List; 2D Arrays; Inheritance; Recursion; Challenges
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)*	Project Lead the Way's (PLTW) End-of-Course Assessments

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
DUAL CREDIT AGREEMENT	
CTSO participation is included:	No
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:	Joni Simpson
Course Adapted From:	Project Lead the Way
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**
This unit focuses on data structures, which are used to represent collections of related data using a single variable rather than multiple variables. Using a data structure, along with iterative statements with appropriate bounds, will allow for similar treatment to be applied more easily to all values in the collection. Just as there are useful standard algorithms when dealing with primitive data, there are standard algorithms to use with data structures. In this unit, students apply standard algorithms to arrays; however, these same algorithms are also used with ArrayLists and 2D arrays.	STEL-1Q, STEL-1R, STEL-2W, STEL-2X, STEL-2Y, STEL-2Z, STEL-7Y, STEL-7AA, STEL-7BB, STEL-7CC, STEL-7DD, STEL-8O	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6,7,8,9) F-BF.1(2,3,4), F-LE.1(2,3,4,5), S-IC.1, S-CP.2 (3,4,5), S-MD.1 (2,3,4,5,6,7)	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-6, HS-PS1-7, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Activities, projects, and quizzes
Building on what students learned previously, data structures are helpful when storing multiple related data values. Arrays have a static size, which causes limitations related to the number of elements stored, and it can be challenging to reorder elements stored in arrays. The ArrayList object has a dynamic size, and the class contains methods for insertion and deletion of elements, making reordering and shifting items easier. Deciding which data structure to select becomes increasingly important as the size of the data set grows, such as when using a large real-world data set. In this unit, students will also learn about privacy concerns related to storing large amounts of personal data, and about what can happen if such information is compromised.	STEL-1Q, STEL-1R, STEL-2T, STEL-2X, STEL-2Y, STEL-2Z, STEL-4P, STEL-4S, STEL-5I, STEL-7W, STEL-7X, STEL-7Y, STEL-7AA, STEL-7BB, STEL-7CC, STEL-7DD, STEL-8N, STEL-8O, STEL-8P	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6,7,8,9) F-BF.1(2,3,4), F-LE.1(2,3,4,5), S-IC.1, S-CP.2 (3,4,5), S-MD.1 (2,3,4,5,6,7)	HS-PS1-1, HS-PS1-4, HS-PS1-6, HS-PS1-7, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Activities, projects, and quizzes

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
Previous concepts will be implemented with two-dimensional (2D) arrays in this unit. A 2D array is most suitable to represent a table. Each table element is accessed using the variable name and row and column indices. Unlike 1D arrays, 2D arrays require nested iterative statements to traverse and access all elements. The easiest way to accomplish this is in row-major order, but it is important to cover additional traversal patterns, such as back and forth or column-major.	STEL-1Q, STEL-1R, STEL-2T, STEL-2X, STEL-2Y, STEL-2Z, STEL-7W, STEL-7X, STEL-7Y, STEL-7AA, STEL-7BB, STEL-7CC, STEL-7DD, STEL-8O, STEL-8P	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6,7,8,9) F-BF.1(2,3,4), F-LE.1(2,3,4,5), S-IC.1, S-CP.2 (3,4,5), S-MD.1 (2,3,4,5,6,7)	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-5, HS-PS1-6, HS-PS1-7, HS-PS1-8, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS2-5, HS-PS3-1, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Activities, projects, and quizzes
Students will pursue a question of interest to them. To accomplish this, they will pose a question, identify a data set that will help them answer the question, and develop a program to use the data set to gain information to help them answer their question.	STEL-1Q, STEL-1R, STEL-2T, STEL-2X, STEL-2Y, STEL-2Z, STEL-7W, STEL-7X, STEL-7Y, STEL-7AA, STEL-7BB, STEL-7CC, STEL-7DD, STEL-8O, STEL-8P	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6,7,8,9) F-BF.1(2,3,4), F-LE.1(2,3,4,5), S-IC.1, S-CP.2 (3,4,5), S-MD.1 (2,3,4,5,6,7)	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-5, HS-PS1-6, HS-PS1-7, HS-PS1-8, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS2-5, HS-PS3-1, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Evaluation of project

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
Creating objects, calling methods on the objects created, and being able to define a new data type by creating a class are essential understandings before moving into this unit. One of the strongest advantages of Java is the ability to categorize classes into hierarchies through inheritance. Certain existing classes can be extended to include new behaviors and attributes without altering existing code. These newly created classes are called subclasses. In this unit, students will learn how to recognize common attributes and behaviors that can be used in a superclass, and will then create a hierarchy by writing subclasses to extend a superclass. Recognizing and utilizing existing hierarchies will help students create more readable and maintainable programs.	STEL-2T, STEL-2U, STEL-2Y, STEL-7x, STEL-7Y, STEL-7AA, STEL-7CC, STEL-7DD, STEL-8N, STEL-8O, STEL-8P, STEL-8Q, STEL-8R	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6,7,8,9) F-BF.1(2,3,4), F-LE.1(2,3,4,5), S-IC.1, S-CP.2 (3,4,5), S-MD.1 (2,3,4,5,6,7)	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-5, HS-PS1-6, HS-PS1-7, HS-PS1-8, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS2-5, HS-PS3-1, HS-PS3-3, HS-PS3-5,	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Activities, projects, and quizzes
Sometimes a problem can be solved by solving smaller or simpler versions of the same problem, rather than attempting an iterative solution. This is called recursion, and it is a powerful math and computer science idea. In this unit, students will revisit how control is passed when methods are called, which is necessary knowledge when working with recursion. In this unit, students will learn how to write simple recursive methods and determine the purpose or output of a recursive method by tracing.	STEL-2T, STEL-2U, STEL-2Y, STEL-7x, STEL-7Y, STEL-7AA, STEL-7CC, STEL-7DD, STEL-8N, STEL-8O, STEL-8P, STEL-8Q, STEL-8R	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6,7,8,9) F-BF.1(2,3,4), F-LE.1(2,3,4,5), S-IC.1, S-CP.2 (3,4,5), S-MD.1 (2,3,4,5,6,7)	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-5, HS-PS1-6, HS-PS1-7, HS-PS1-8, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS2-5, HS-PS3-1, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Evaluation of project

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
The student will select a problem that brings together all of the skills they have learned throughout the course. Students will use the software development cycle they have used in other projects. In this problem, they will design and develop a program of their choosing.	STEL-1P, STEL-1Q, STEL-1R, STEL-2T, STEL-2V, STEL-2W, STEL-2X, STEL-2Y, STEL-2Z, STEL-3H, STEL-3I, STEL-3J, STEL-4P, STEL-4S, STEL-4T, STEL-5I, STEL-6J, STEL-6H, STEL-7Y, STEL-7Z, STEL-7AA, STEL-7BB, STEL-7CC, STEL-7DD, STEL-8N, STEL-8O, STEL-8P, STEL-8Q, STEL-8R	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6,7,8,9) F-BF.1(2,3,4), F-LE.1(2,3,4,5), S-IC.1, S-CP.2 (3,4,5), S-MD.1 (2,3,4,5,6,7)	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-5, HS-PS1-6, HS-PS1-7, HS-PS1-8, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS2-5, HS-PS3-1, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Evaluation of project

INSTRUCTIONAL RESOURCES	
List the major instructional resources used for this course:	
Websites:	Project Lead the Way (PLTW) - https://www.pltw.org
Textbooks:	PLTW materials
Essential Equipment:	Computer
Reference Materials:	PLTW materials provided
Supplies:	Computer

Computer Science Principles 1A

COURSE INFORMATION	
Course Name:	Computer Science Principles 1A
Course Number:	CTEF211
Grade(s):	9-12
Length (# of semesters):	One semester
Credit:	0.5
Foundational Course:	☐ This is a foundational CTE course (foundational courses are not technical)
Prerequisites:	*Computer Essentials 1A/1B* or permission from instructor
Sequence or CTEPS:	Information Technology
Date of District Course Revision:	Spring 2022
CAREER & TECHNICAL STUDENT ORGANIZATION (CTSO)	
CTSO Embedded in this Sequence:	Technology Student Association (TSA)
TECHNICAL/OCCUPATIONAL STANDARDS	
Source(s) of Technical Standards:	Standards for Technological and Engineering Literacy
Names/Numbers of Technical Standards:	STEL-4T, STEL-7DD
REGISTRATION INFORMATION	
Course Description: (Brief paragraph - as will be shown in the student course catalog)	In *Computer Science Principles 1A*, students will express their creativity through code. They will analyze computing innovations and the impacts it has on their lives, and use abstraction and algorithmic thinking to solve problems and create value for others. Students will also develop, analyze, implement, and test programs developed for a purpose. They will learn to uncover patterns in data, learn how to protect data, and explore how the internet connects the world in which we live. Whether seeking a future career in the growing field of computer science or learning how computer science is transforming all careers, students in *Computer Science Principles 1A* learn the fundamentals of coding, data processing, data security, and automating tasks while learning to contribute to an inclusive, safe, and ethical computing culture. This is a Project Lead the Way (PLTW) course. PLTW courses require specialized instructor training and the use of PLTW curriculum and materials. As such, this course may not be taught at schools without prior district approval. Contact CTE and/or Teaching and Learning for more information.

Instructional Topic Headings: (Separate each heading with a semi-colon.)	Algorithms; Abstraction; Artistic Expression through Code; Data Diligence; How the Internet Works; Creating a Custom Encoder
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)*	Project Lead the Way's (PLTW) End-of-Course Assessments
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
DUAL CREDIT AGREEMENT	
CTSO participation is included:	No
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:	Joni Simpson
Course Adapted From:	Project Lead the Way
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 be introduced to text-based programming at a level appropriate for novice programmers. Students create original programs using turtle graphics while learning how variables, inputs, and outputs come together in an algorithm to make things happen. The foundations for later algorithmic thinking are established by focusing on the most common roles that variables fulfill and using standard code libraries to customize their programs.	STEL-7W, STEL-7Y, STEL-7AA, STEL-7BB, STEL-7CC, STEL-7DD	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1, A-SSE.2, A-SSE.3, A-REI.1, F-LE.1, F-IF.8, F-IF.9, F-LE.1, S-IC.1-6, S-CP.1, S-IC.5, S-CP.2, S-CP.3, S-CP.4, S-CP.5, S-ID.1-6	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-6, HS-PS1-7, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Activities, projects, and quizzes
Students will learn to use abstractions such as procedures, functions, lists, and data types as they work on engaging programs and develop interactive games.	STEL-7W, STEL-7Y, STEL-7AA, STEL-7BB, STEL-7CC, STEL-7DD	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6), F-IF.9, F-BF.1, F-LE.1(2), S-IC.1, S-CP.2(3,4,5)	HS-PS1-1, HS-PS1-4, HS-PS1-6, HS-PS1-7, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Evaluate game and solve problems

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 apply all the coding fundamentals and computational thinking practices they have learned to create a program of their choosing.	STEL-7W, STEL-7Y, STEL-7AA, STEL-7BB, STEL-7CC, STEL-7DD	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6) F-IF.9, F-BF.1, F-LE.1(2), S-IC.1, S-CP.2(3,4,5)	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-5, HS-PS1-6, HS-PS1-7, HS-PS1-8, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS2-5, HS-PS3-1, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Evaluation of project
Students will be introduced to personal cybersecurity by exploring password strength, encryption, and what it takes to protect data. Students focus on cybersecurity from the perspectives of the user, the software developer, the business, the nation, and the citizen.	STEL-6F, STEL-7W, STEL-7Y, STEL-7AA, STEL-7CC, STEL-7DD	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6) F-IF.9, F-BF.1, F-LE.1(2), S-IC.1, S-CP.2(3,4,5)	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-5, HS-PS1-6, HS-PS1-7, HS-PS1-8, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS2-5, HS-PS3-1, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Quizzes and problem evaluation

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 come to understand the internet as a set of computers exchanging bits in the form of packets. Students employ appropriate tools to explore the internet's hierarchical infrastructure and create their own custom user interfaces to examine the internet and understand how it works.	STEL-7W, STEL-7Y, STEL-7AA, STEL-7CC, STEL-7DD	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6), F-IF.9, F-BF.1, F-LE.1(2), S-IC.1, S-CP.2(3,4,5)	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-5, HS-PS1-6, HS-PS1-7, HS-PS1-8, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS2-5, HS-PS3-1, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Quizzes and problem evaluation
Students will exchange keys and messages and use Python® functions to encode and decode data. The encoders that students create may store data in any number of ways, from notes in a song to alpha values in an image or the movements of objects in a virtual environment on their screen.	STEL-7W, STEL-7Y, STEL-7AA, STEL-7CC, STEL-7DD	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6), F-IF.9, F-BF.1, F-LE.1(2), S-IC.1, S-CP.2(3,4,5)	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-5, HS-PS1-6, HS-PS1-7, HS-PS1-8, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS2-5, HS-PS3-1, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Evaluation of project

INSTRUCTIONAL RESOURCES	
List the major instructional resources used for this course:	
Websites:	Project Lead the Way (PLTW) - https://www.pltw.org
Textbooks:	PLTW materials
Essential Equipment:	Computer
Reference Materials:	PLTW materials provided
Supplies:	Computer

Computer Science Principles 1B

COURSE INFORMATION	
Course Name:	Computer Science Principles 1B
Course Number:	CTEF212
Grade(s):	9-12
Length (# of semesters):	One semester
Credit:	0.5
Foundational Course:	☐ This is a foundational CTE course (foundational courses are not technical)
Prerequisites:	*Computer Science Principles 1A* or permission from instructor
Sequence or CTEPS:	Information Technology
Date of District Course Revision:	Spring 2022
CAREER & TECHNICAL STUDENT ORGANIZATION (CTSO)	
CTSO Embedded in this Sequence:	Technology Student Association (TSA)
TECHNICAL/OCCUPATIONAL STANDARDS	
Source(s) of Technical Standards:	Standards for Technological and Engineering Literacy
Names/Numbers of Technical Standards:	STEL-4T, STEL-7DD
REGISTRATION INFORMATION	
Course Description: (Brief paragraph - as will be shown in the student course catalog)	In *Computer Science Principles 1B*, students will continue to express their creativity through code. They will analyze computing innovations and the impacts it has on their lives, and use abstraction and algorithmic thinking to solve problems and create value for others. Students will also develop, analyze, implement, and test programs developed for a purpose. They will learn to uncover patterns in data, learn how to protect data, and explore how the internet connects the world in which we live. Whether seeking a future career in the growing field of computer science or learning how computer science is transforming all careers, students in Computer Science Principles learn the fundamentals of coding, data processing, data security, and automating tasks while learning to contribute to an inclusive, safe, and ethical computing culture. This is a Project Lead the Way (PLTW) course. PLTW courses require specialized instructor training and the use of PLTW curriculum and materials. As such, this course may not be taught at schools without prior district approval. Contact CTE and/or Teaching and Learning for more information.

Instructional Topic Headings: (Separate each heading with a semi-colon.)	Little Data; Trendy Data; Making Predictions from Data; Simulating the Real World; Future Innovations; Impacts of Computing Innovations
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)*	Project Lead the Way's (PLTW) End-of-Course Assessments
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
DUAL CREDIT AGREEMENT	
CTSO participation is included:	No
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:	Joni Simpson
Course Adapted From:	Project Lead the Way
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 create a range of visualizations of small sets of data collected using Vernier sensors, and find meaning in the patterns they uncover. Students learn that information is a collection of facts and patterns they can extract from data. They explore how our world can be translated into digital representations to be collected, stored, and analyzed. Students use grade-level-appropriate statistics to deepen the meaning of knowledge gained through visualization.	STEL-4T	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	S-IC.1-6, S-CP.1, S-IC.5, S-CP.2, S-CP.3, S-CP.4, S-CP.5, S-ID.1-6	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-6, HS-PS1-7, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Activities, projects, and quizzes
The goal of this lesson is for students to create a range of visualizations to analyze and interpret the patterns they uncover, this time using larger, complex sets of data. From the data they draw conclusions relevant to themselves, including local weather, the economics of their community, and trends across the world. Students explore the wide range of data sets available today, and begin to understand how claims can be made by examining correlation and causation.	STEL-7W, STEL-7Y, STEL-7AA, STEL-7BB, STEL-7CC, STEL-7DD	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	S-IC.1, S-CP.2(3,4,5)	HS-PS1-1, HS-PS1-4, HS-PS1-6, HS-PS1-7, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Activities, projects, and quizzes

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 work in teams to choose a question or problem, making and supporting an argument using large sets of data.	STEL-7W, STEL-7Y, STEL-7AA, STEL-7BB, STEL-7CC, STEL-7DD	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6), F-IF.9, F-BF.1, F-LE.1(2), S-IC.1, S-CP.2(3,4,5)	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-5, HS-PS1-6, HS-PS1-7, HS-PS1-8, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS2-5, HS-PS3-1, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Evaluation of project
Students will explain how computers can be used to represent real-world phenomena or outcomes. They compare the use of simulations with real-world contexts. They begin by exploring modeling and simulations to study systems that are complex, dangerous, expensive, big, or even too small to easily observe otherwise.	STEL-7W, STEL-7Y, STEL-7AA, STEL-7BB, STEL-7CC, STEL-7DD	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6), F-IF.9, F-BF.1, F-LE.1(2), S-IC.1, S-CP.2(3,4,5)	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-5, HS-PS1-6, HS-PS1-7, HS-PS1-8, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS2-5, HS-PS3-1, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Quizzes and problem evaluation

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 explore computing innovations (such as machine learning, artificial intelligence, and cloud computing) by exploring the vast amount of tools and resources available through an AWS Educate account. They also examine factors that contribute to the digital divide.	STEL-6H, STEL-7W, STEL-7Y, STEL-7AA, STEL-7CC, STEL-7DD	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6), F-IF.9, F-BF.1, F-LE.1(2), S-IC.1, S-CP.2(3,4,5)	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-5, HS-PS1-6, HS-PS1-7, HS-PS1-8, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS2-5, HS-PS3-1, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Quizzes and problem evaluation
Students will select a computing innovation and create a digital artifact that describes the computing innovation's impact. They explore the legal, ethical, and unintended consequences of its use.	STEL-4T, STEL-5, STEL-6F, STEL-6G, STEL-6H, STEL-7W, STEL-7Y, STEL-7AA, STEL-7BB, STEL-7CC, STEL-7DD	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6), F-IF.9, F-BF.1, F-LE.1(2), S-IC.1, S-CP.2(3,4,5)	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-5, HS-PS1-6, HS-PS1-7, HS-PS1-8, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS2-5, HS-PS3-1, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Evaluation of project

INSTRUCTIONAL RESOURCES	
List the major instructional resources used for this course:	
Websites:	Project Lead the Way (PLTW) - https://www.pltw.org
Textbooks:	PLTW materials
Essential Equipment:	Computer
Reference Materials:	PLTW materials provided
Supplies:	Computer

Cybersecurity 1A

COURSE INFORMATION	
Course Name:	Cybersecurity 1A
Course Number:	CTEF311
Grade(s):	10-12
Length (# of semesters):	One semester
Credit:	0.5
Foundational Course:	☐ This is a foundational CTE course (foundational courses are not technical)
Prerequisites:	None
Sequence or CTEPS:	Information Technology
Date of District Course Revision:	Spring 2022
CAREER & TECHNICAL STUDENT ORGANIZATION (CTSO)	
CTSO Embedded in this Sequence:	Technology Student Association (TSA)
TECHNICAL/OCCUPATIONAL STANDARDS	
Source(s) of Technical Standards:	NICE Cybersecurity Workforce Framework
Names/Numbers of Technical Standards:	A0001 – K0158
REGISTRATION INFORMATION	
Course Description: (Brief paragraph - as will be shown in the student course catalog)	Students in *Cybersecurity 1A* will learn to identify cybersecurity threats and protect against them. They will learn to detect intrusions and respond to attacks, will begin to examine their own digital footprint and better defend their own personal data, and learn how organizations protect themselves in today's world. Whether students are interested in a future career in the emerging field of cybersecurity, or would like to learn how to defend their own personal data or a company's data, students in *Cybersecurity 1A* will establish an ethical code of conduct while learning to defend data in today's complex cyber world. This course helps prepare students for CompTIA's Security+ certification exam. In order to have the FNSBSD instructor sign-off that a student is ready to test, the student must complete semesters 1 and 2 of Cybersecurity. This is a Project Lead the Way (PLTW) course. PLTW courses require specialized instructor training and the use of PLTW curriculum and materials. As such, this course may not be taught at schools without prior district approval. Contact CTE and/or Teaching and Learning for more information.

Instructional Topic Headings: (Separate each heading with a semi-colon.)	Introduction to Cybersecurity; Security and the Internet; Protect Your Data; Information Architecture; Server Vulnerabilities; Server Exploits; The Ecommerce Site
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)*	Security + (CompTIA) In order to have the FNSBSD instructor sign-off that a student is ready to test, the student must complete semesters 1 and 2 of Cybersecurity.
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
DUAL CREDIT AGREEMENT	
CTSO participation is included:	No
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:	Joni Simpson
Course Adapted From:	Project Lead the Way
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 learn personal and digital security, describe why it is important, and learn to be safe consumers of digital information in a variety of contexts.	A0014, A0042, A0069, A0074, A0085, A0092, A0106, A0123, A0155, S0052, K0158	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6		HS-PS1-2	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Activities, observation, and quizzes
Students learn that the internet is a loosely controlled collection of computers networked together and secured by firewalls. They will learn the basic types of malware, security features of a browser, and how not to be a victim. They learn about files and processes, how to manage these, and how to identify suspicious data.	A0001, A0014, A0025, A0026, A0040, A0042, A0069, A0070, A0074, A0106, A0123, A0155	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, A-SSE.1, A-SSE.3, A-REI.1, F-LE.1	HS-PS1-2 HS-PS1-4 HS-PS1-6 HS-PS1-7 HS-PS2-1 HS-PS2-2 HS-PS2-3 HS-PS2-4 HS-PS3-3 HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Role play and solve malware problem
Students use their knowledge about files, directories, processes, browsers, suspicious emails, and malware to solve the unit problem.	A0001, A0013, A0014, A0019, A0021, A0025, A0040, A0062, A0069, A0070, A0074, A0085, A0092, A0105, A0106, A0120, A0123, A0155	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, A-SSE.1, A-SSE.3, A-REI.1, F-LE.1, F-IF.8, F-IF.9, F-LE.1, S-IC.3, S-CP.1, S-IC.5, S-CP.2, S-CP.3, S-CP.4, S-CP.5	HS-PS1-2 HS-PS1-4 HS-PS1-6 HS-PS1-7 HS-PS2-1 HS-PS2-2 HS-PS2-3 HS-PS2-4 HS-PS3-3 HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Observation and problem resolution

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 delve into information confidentiality and how it relates to information integrity and assurance, as they compare the value and the risks of sharing information. Students learn how to host names related to digital addresses, demystify the "cloud," learn how networks evolve, and explore the security of a small network.	A0030, A0049, A0061, A0083, A0093, A0106, A0107, A0120, A0123, A0155	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, A-SSE.1, A-SSE.3, A-REI.1, F-LE.1, F-IF.8, F-IF.9, F-LE.1, S-IC.3, S-CP.1, S-IC.5, S-CP.2, S-CP.3, S-CP.4, S-CP.5	HS-PS1-2 HS-PS1-4 HS-PS1-6 HS-PS1-7 HS-PS2-1 HS-PS2-2 HS-PS2-3 HS-PS2-4 HS-PS3-3 HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Test and application problems
Students learn more about the types of malware that are threats to information and the types of delivery systems. Using website applications and the back-end services that support them, they learn how attacks can occur. They explore a vulnerable web server and improve its security measures.	A0070, A0074, K0158	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	A-SSE.1, A-SSE.3, A-REI.1, F-LE.1, F-IF.8, F-IF.9, F-LE.1, S-IC.3, S-CP.1, S-IC.5, S-CP.2, S-CP.3, S-CP.4, S-CP.5	HS-PS1-2 HS-PS1-4 HS-PS1-6 HS-PS1-7 HS-PS2-1 HS-PS2-2	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Test and application problems
Students delve deeper into how malware propagates and research the symptoms of various exploits. They analyze and secure one of the most common vulnerable environments: a web server hosting client applications.	A0001, A0003, A0010, A0015, A0026, A0048, A0049, A0055, A0058, A0083, A0106, A0107, A0126, A0128	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, A-SSE.1, A-SSE.3, A-REI.1, F-LE.1, F-IF.8, F-IF.9, F-LE.1, S-IC.3, S-CP.1, S-IC.5, S-CP.2, S-CP.3, S-CP.4, S-CP.5	HS-PS1-2 HS-PS1-4 HS-PS1-6 HS-PS1-7 HS-PS2-1 HS-PS2-2 HS-PS2-3 HS-PS2-4 HS-PS3-3 HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Quizzes

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 learn how information can be safely and securely exchanged on a public network. In the end-of-unit problem, students discover a breach, identify the security vulnerabilities, and enhance the system to secure it.	A0001, A0003, A0010, A0011, A0012, A0013, A0014, A0015, A0019, A0025, A0026, A0027, A0030, A0035, A0040, A0042, A0048, A0049, A0062, A0067, A0069, A0070, A0074, A0083, A0085, A0086, A0092, A0093, A0097, A0101, A0105, A0106, A0107, A0120, A0123, A0128, A0172	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, A-SSE.1, A-SSE.3, A-REI.1, F-LE.1, F-IF.8, F-IF.9, F-LE.1, S-IC.3, S-CP.1, S-IC.5, S-CP.2, S-CP.3, S-CP.4, S-CP.5	HS-PS1-2 HS-PS1-4 HS-PS1-6 HS-PS1-7 HS-PS2-1 HS-PS2-2 HS-PS2-3 HS-PS2-4 HS-PS3-3 HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Resolution of problem

INSTRUCTIONAL RESOURCES	
List the major instructional resources used for this course:	
Websites:	Project Lead the Way (PLTW) - https://www.pltw.org
Textbooks:	PLTW materials
Essential Equipment:	Computer
Reference Materials:	PLTW materials provided
Supplies:	Computer

Cybersecurity 1B

COURSE INFORMATION	
Course Name:	Cybersecurity 1B
Course Number:	CTEF312
Grade(s):	10-12
Length (# of semesters):	One semester
Credit:	0.5
Foundational Course:	☐ This is a foundational CTE course (foundational courses are not technical)
Prerequisites:	*Cybersecurity 1A*
Sequence or CTEPS:	Information Technology
Date of District Course Revision:	Spring 2022
CAREER & TECHNICAL STUDENT ORGANIZATION (CTSO)	
CTSO Embedded in this Sequence:	Technology Student Association (TSA)
TECHNICAL/OCCUPATIONAL STANDARDS	
Source(s) of Technical Standards:	NICE Cybersecurity Workforce Framework
Names/Numbers of Technical Standards:	A0001 – K0158
REGISTRATION INFORMATION	
Course Description: (Brief paragraph - as will be shown in the student course catalog)	Students in *Cybersecurity 1B* will learn to identify cybersecurity threats and protect against them. They will learn to detect intrusions and respond to attacks, will begin to examine their own digital footprint and better defend their own personal data, and learn how organizations protect themselves in today's world. Whether students are interested in a future career in the emerging field of cybersecurity, or would like to learn how to defend their own personal data or a company's data, students in *Cybersecurity 1B* will establish an ethical code of conduct while learning to defend data in today's complex cyber world. This course helps prepare students for CompTIA's Security+ certification exam. In order to have the FNSBSD instructor sign-off that a student is ready to test, the student must complete semesters 1 and 2 of Cybersecurity. This is a Project Lead the Way (PLTW) course. PLTW courses require specialized instructor training and the use of PLTW curriculum and materials. As such, this course may not be taught at schools without prior district approval. Contact CTE and/or Teaching and Learning for more information.

Instructional Topic Headings: (Separate each heading with a semi-colon.)	Files and Processes; Attacks from the Net; Analyzing the Net; Secure the Net; Cryptography; Digital Forensics; Criminal Justice and Computer Science
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)*	Security+ (CompTIA) In order to have the FNSBSD instructor sign-off that a student is ready to test, the student must complete semesters 1 and 2 of Cybersecurity.
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
DUAL CREDIT AGREEMENT	
CTSO participation is included:	No
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:	Joni Simpson
Course Adapted From:	Project Lead the Way
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 learn how an operating system organizes information using command line tools to manage and secure digital information. They will learn about user and system processes, and how malware spreads around a network. They will identify suspicious software running on the system, and determine the problems it may have caused.	A0001, A0010, A0015, A0048, A0049, A0052, A0055, A0058, A0059, A0065, A0083, A0084, A0085, A0096, A0097, A0106, A0107, A0127, A0128, A0159	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, A-SSE.1, A-SSE.3, A-REI.1, F-LE.1, F-IF.8, F-IF.9, F-LE.1, S-IC.1-6, S-CP.1, S-IC.5, S-CP.2, S-CP.3, S-CP.4, S-CP.5, S-ID.1-6	HS-PS1-2 HS-PS1-4 HS-PS1-6 HS-PS1-7 HS-PS2-1 HS-PS2-2 HS-PS2-3 HS-PS2-4 HS-PS3-3 HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Activities, Observation, and quizzes
Students will explore network topologies and go deeper down the abstraction path to learn more about network security. They will analyze network traffic, find patterns that may represent exploits, and identify security vulnerabilities.	A0001, A0010, A0015, A0019, A0025, A0026, A0030, A0035, A0048, A0049, A0052, A0055, A0058, A0059, A0065, A0083, A0084, A0097, A0106, A0107, A0113, A0124, A0127, A0128, A0159, A0172	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, A-SSE.1, A-SSE.3, A-REI.1, F-LE.1, F-IF.8, F-IF.9, F-LE.1, S-IC.1-6, S-CP.1, S-IC.5, S-CP.2, S-CP.3, S-CP.4, S-CP.5, S-ID.1-6	HS-PS1-2 HS-PS1-4 HS-PS1-6 HS-PS1-7 HS-PS2-1 HS-PS2-2 HS-PS2-3 HS-PS2-4 HS-PS3-3 HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Role play and solve challenges around network security.

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 analyze network traffic to witness, and then protect against, a malware attack. They analyze packets to find telltale signs and patterns of malicious exploits. They apply what they have learned to perform a penetration test and secure a network against further attacks.	A0001, A0003, A0010, A0015, A0019, A0021, A0026, A0030, A0040, A0048, A0049, A0052, A0055, A0058, A0059, A0061, A0062, A0065, A0080, A0083, A0084, A0086, A0092, A0093, A0096, A0097, A0101, A0106, A0107, A0124, A0126, A0127, A0128, A0155, A0159, K0158	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, A-SSE.1, A-SSE.3, A-REI.1, F-LE.1, F-IF.8, F-IF.9, F-LE.1, S-IC.3, S-CP.1, S-IC.5, S-CP.2, S-CP.3, S-CP.4, S-CP.5	HS-PS1-2 HS-PS1-4 HS-PS1-6 HS-PS1-7 HS-PS2-1 HS-PS2-2 HS-PS2-3 HS-PS2-4 HS-PS3-3 HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Observation and problem resolution
Students are given an attack scenario and must identify the exploit, secure the system, and make improvements to prohibit future attacks.	A0001, A0003, A0010, A0011, A0012, A0013, A0014, A0015, A0019, A0021, A0035, A0041, A0048, A0049, A0052, A0055, A0058, A0059, A0061, A0062, A0065, A0067, A0069, A0070, A0074, A0080, A0083, A0084, A0085, A0086, A0092, A0093, A0096, A0097, A0101, A0105, A0106, A0107, A0113, A0124, A0126, A0127, A0128, A0155, A0159, K0158	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, A-SSE.1, A-SSE.3, A-REI.1, F-LE.1, F-IF.8, F-IF.9, F-LE.1, S-IC.1-6, S-CP.1, S-IC.5, S-CP.2, S-CP.3, S-CP.4, S-CP.5, S-ID.1-6	HS-PS1-2 HS-PS1-4 HS-PS1-6 HS-PS1-7 HS-PS2-1 HS-PS2-2 HS-PS2-3 HS-PS2-4 HS-PS3-3 HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Resolution of problem

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 learn the history of encryption and ciphers, and use frequency predictors to try to break the codes. They practice data hiding techniques, such as cryptography and steganography. Finally, they attempt to decrypt each other's encrypted messages.	A0003, A0005, A0080, A0083, A0106	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	A-REI.1, F-LE.1, F-IF.8, F-IF.9, F-LE.1, S-IC.3, S-CP.1, S-IC.5, S-CP.2, S-CP.3, S-CP.4, S-CP.5	HS-PS1-2 HS-PS1-4 HS-PS1-6 HS-PS1-7 HS-PS2-1 HS-PS2-2	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Application problems
Students learn the process of gathering digital evidence, analyzing it, trace the criminal through their digital footprint, and prepare to prosecute the criminal. Students will use skills to identify crimes and capture criminals.	A0001, A0003, A0005, A0010, A0011, A0012, A0013, A0014, A0015, A0019, A0021, A0025, A0027, A0035, A0041, A0043, A0048, A0049, A0052, A0055, A0058, A0059, A0061, A0062, A0065, A0067, A0069, A0070, A0074, A0080, A0083, A0084, A0085, A0086, A0092, A0093, A0096, A0097, A0101, A0105, A0106, A0107, A0113, A0120, A0124, A0126, A0127, A0128, A0155, A0159	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, A-SSE.1, A-SSE.3, A-REI.1, F-LE.1, F-IF.8, F-IF.9, F-LE.1, S-IC.1-6, S-CP.1, S-IC.5, S-CP.2, S-CP.3, S-CP.4, S-CP.5, S-ID.1-6	HS-PS1-2 HS-PS1-4 HS-PS1-6 HS-PS1-7 HS-PS2-1 HS-PS2-2 HS-PS2-3 HS-PS2-4 HS-PS3-3 HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Application problems and problem resolution

INSTRUCTIONAL RESOURCES	
List the major instructional resources used for this course:	
Websites:	Project Lead the Way (PLTW) - https://www.pltw.org
Textbooks:	PLTW materials
Essential Equipment:	Computer
Reference Materials:	PLTW materials provided
Supplies:	Computer

IT Networking

COURSE INFORMATION	
Course Name:	IT Networking
Course Number:	CTEF305
Grade(s):	9-12
Length (# of semesters):	One semester
Credit:	0.5
Foundational Course:	☐ This is a foundational CTE course (foundational courses are not technical)
Prerequisites:	*Computer Essentials 1A/1B* or permission from the instructor
Sequence or CTEPS:	Information Technology
Date of District Course Revision:	Spring 2022
CAREER & TECHNICAL STUDENT ORGANIZATION (CTSO)	
CTSO Embedded in this Sequence:	Technology Student Association (TSA)
TECHNICAL/OCCUPATIONAL STANDARDS	
Source(s) of Technical Standards:	National Business Education Association (NBEA)
Names/Numbers of Technical Standards:	NBEA X – NBEA XVII
REGISTRATION INFORMATION	
Course Description: (Brief paragraph - as will be shown in the student course catalog)	*IT Networking* presents higher-level experience in working with networking hardware, infrastructure, and systems. Students will engage in hands-on labs and activities to design and implement functional networks. They will configure, manage, and maintain essential network devices (such as switches and routers), and learn to segment network traffic. They will learn about various cable technologies, and effective practices for designing and implementing network cabling and infrastructure. Students will also gain experience analyzing existing types of wired and wireless network configurations, implementing network security and protocols, and troubleshooting network problems. This course helps prepare students for CompTIA's Network+ Certification.
Instructional Topic Headings: (Separate each heading with a semi-colon.)	Networking Concepts; Mobile Devices; Network Architectures; Security; Network Operations; Internal and External Access; Network Troubleshooting and Tools; Virtualization

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)*	Network+ Certification (CompTIA)
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
DUAL CREDIT AGREEMENT	
CTSO participation is included:	Yes
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:	David Brannan, Skyler Evans, Jenny Long, and Joni Simpson
Course Adapted From:	CompTIA Network
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 identify and determine appropriate tools to support network connectivity & performance.	NBEA XII	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6		HS-PS1-1, HS-PS1-2, HS-PS1-6, HS-PS1-7, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS2-6	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Activities, projects, and quizzes
Students will identify and counter common physical, software, and network security risks.	NBEA XIV	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	S-IC.1, S-CP.2(3,4,5)	HS-PS1-1, HS-PS1-2, HS-PS1-6, HS-PS1-7, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS2-6	A.1, B.2, B.3, B.4,	A.1, A.2, A.5, A.6	Activities, projects, and quizzes
Students will identify and implement a variety of common network architectures.	NBEA X	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, S-ID.1, S-IC.1	HS-PS1-1, HS-PS1-2, HS-PS1-6, HS-PS1-7, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS2-6	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Evaluation of project

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 perform preventative maintenance on networking equipment, including switches and routers, to ensure stable and reliable performance.	NBEA XVI	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	S-IC.1, S-CP.2(3,4,5)	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-5, HS-PS1-6, HS-PS1-7, HS-PS1-8, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS2-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Quizzes and problem evaluation
Students will configure computers and mobile devices to connect and communicate on various networks.	NBEA XII	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6)	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-5, HS-PS1-6, HS-PS1-7, HS-PS1-8, HS-PS2-1, HS-PS2-2, HS-PS2-3, HS-PS2-4, HS-PS2-5, HS-PS3-1, HS-PS3-3, HS-PS3-5	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Quizzes and problem evaluation

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 conduct research to upgrade network systems based on costs and needs.	NBEA X	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4),A-REI.1	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-5, HS-PS1-6, HS-PS1-7, HS-PS1-8	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Evaluation of project
Students will design wired and wireless network infrastructures, with an awareness of space, uptime, and availability requirements.	NBEA X, XII	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6)	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-5, HS-PS1-6, HS-PS1-7, HS-PS1-8	A.1, B.2, B.3, B.4	A.1, A.2, A.5, A.6	Evaluation of project
Students will understand the strengths and weaknesses of different cabling and wireless standards, and implement them appropriately.	NBEA XIII, XIV	Reading Info (grades 9-12) 1, 2, 4, 5, 7, 10 Writing (grades 9-12) 2a-f, 3a-e, 4-10 Speaking & Listening 1a-d, 2,4-6	N-Q.1, N-Q.2, N-CN.7, A-SSE.1 (2,3), A-APR.1 (2,3,4), A-REI.1, F-IF.1 (2,3,4,5,6)	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-4, HS-PS1-5, HS-PS1-6, HS-PS1-7, HS-PS1-8	A.1, B.2, B.3, B.4,	A.1, A.2, A.5, A.6	Evaluation of project

INSTRUCTIONAL RESOURCES	
List the major instructional resources used for this course:	
Websites:	
Textbooks:	
Essential Equipment:	Computer
Reference Materials:	
Supplies:	Computer

The Fairbanks North Star Borough School District is an equal employment and educational opportunity institution, as well as a tobacco and nicotine-free learning and work environment.

Fairbanks North Star Borough School District
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