

CTE Course Description and Standards Crosswalk

Course Information

Course Name	Digital Electronics
Course Number	86431
Number of High School Credits	.5
Sequence or CTEPS (You must first have the Sequence or CTEPS entered into the EED-CTE system.)	Pre-Engineering
Date of district Course Revision	March 2014

Career & Technical Student Organization (CTSO)

CTSO embedded in this sequence	Skills USA
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Occupational Standards

Source of Occupational Standards	States Career Cluster Initiative (STEM); PLTW
Names/Numbers of Occupational Standards	SCCI; PLTW – Digital Electronics

Registration Information

Course Description (brief paragraph – as shown in your student handbook or course list)	Digital Electronics is a course in applied logic that encompasses the application of electronic circuits and devices. Computer simulation software is used to design and test digital circuitry prior to the actual construction of circuits and devices. PLTW is supplemental to course objectives.
Instructional Topic Headings (please separate each heading by a semi-colon)	Safety; Logic Gates; Registers and Counters; Analog and Digital Waveforms; Electron Theory; Programmable Logic Devices; Microprocessors; Flip-Flop Applications

Summative Assessments and Standards

Technical Skills Assessment (TSA)	Yes
Course addresses:	PLTW – Digital Electronics
New Alaska ELA and Math Standards	Yes
Alaska Cultural Standards	Yes
All Aspects of Industry (AAI)	Yes
Core Technical Standards	Yes
Employability Standards	Yes

Employability Standards

Source of Employability Standards	State of Alaska
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Tech Prep

Current Tech Prep Articulation Agreement? (Y/N)	No
Date of Current Agreement	
Postsecondary Institution Name	
Postsecondary Course Name	
Postsecondary Course Number	
# of Postsecondary Credits	

Additional CTE Course Information

Author	
Course developed by	Revised by Mary Shreves
Course adapted from	PLTW
Date of previous course revision	May 2010 (Ralph)
Course Delivery Model	
Is the course brokered through another institution or agency? (Y/N)	No

Standards Alignment

Student Performance Standards (Learner Outcomes or Knowledge & Skill Statements)	Specific Occupational Skills Standard	Common Technical Core Standards	New Alaska ENG/LA Standards	New Alaska Math Standards	Alaska Cultural Standards	Employability/ Career Readiness Standards	All Aspects of Industry/ Systems	Assessment
Students will understand safety concepts related to working with electricity and soldering irons, and become familiar with precautionary measures.	SCC06	ST3	L.11-12.6 RST.11-12.3 RST.9-10.3 RI.9-10	S-MD.6 & 7	B:2,3,4	A:2,5,6	Technology Technical Skills Health & Safety	PLTW Assessments
Students will understand numerical place value, and learn to use scientific notation, engineering notation, and Systems International (SI) notation.	SCC01 SCPA01.01 SCPA01.02 SCPA01.03	ST1,2,4,6 ST-ET1,2,3,4,5,6	RST.11-12.4 L.11-12.6	N-Q.1-3	B:2,3,4	A:2,5	Technology Technical Skills	PLTW Assessments
Students will understand the binary number system and its relationship to the combinational logic design process.	SCPA01.01 SCPA01.06 SCPA.03	ST1,2,4,5,6 ST-ET1,2,3,4,5,6	L.11-12.6 RST.9-10.4&.7 RST.11-12.7	N-Q.1-3	B2,4	A2	Technology Technical Skills	PLTW Assessments
Students will learn to translate a set of design specifications into a truth table, and be able to derive logic expressions from truth tables, and likewise to create a truth table from logic expressions.	SCPA03 SCPA.01.01.01	ST1,4 ST-ET1,3,4	RL.11-12.4 L.9-10.6 L.11-12.3A, 6	N-VM.6	B2,4	A2	Technology Technical Skills	PLTW Assessments

DISTRICT NAME: Mat-Su Borough School District

Student Performance Standards (Learner Outcomes or Knowledge & Skill Statements)	Specific Occupational Skills Standard	Common Technical Core Standards	New Alaska ENG/LA Standards	New Alaska Math Standards	Alaska Cultural Standards	Employability/ Career Readiness Standards	All Aspects of Industry/ Systems	Assessment
Students will use computer based circuit design software to create and test circuits. Students will also use breadboards to build circuits after design and testing on the circuit design software.	SCC03 SCC04 SCC10 SCPA03 SCPA04 SCPA10	ST1,2,4 ST- ET1,2,3,4,5 ,6	RL.11- 12.4 L.9-10.6 L.11- 12.3A, 6	S-IC.6	B2,4	A2	Technology Technical Skills	PLTW Assessment s
Students will use schematics and symbolic algebra to represent digital gates in the creation of solutions to design problems.	SCC04.02.02 SCPA01.01 SCPA01.02 SCPS01.03 SCPA03 SCPA10	ST1,2,4,5,6 ST- ET1,2,3,4,5 ,6	SL.11- 12.2 RST.11- 12.4 L.9-12.6	N-Q.1,2	B:2,3,4	A:2,5	Technology Technical Skills	PLTW Assessment s
Students will be able to create Boolean Expressions, logic circuit diagrams or truth tables from information provided in the solution of design problems.	SCPA03 SCPA.01.01.0 1	ST1,2,4 ST- ET1,2,3,4,5 ,6	SL.11- 12.2 RST.11- 12.3,4,7 L.9-12.6	N-Q.1-3 A-CED.4 A-REI.1 A-SSE.3 A-APR.1	B:2,3,4	A:2,5	Technology Technical Skills	PLTW Assessment s
Students will learn that logic expressions can be implemented using logic gates, e.g. AND, OR, Inverter, NAND, NOR, gates.	SCPA03 SCPA04.01.0 1 SCPA01.01.0 1	ST1,2,4,5 ST- ET1,2,3,4,5 ,6	RST.11- 12.4 RST.11- 12.3 RST.9- 10.4 RL.11- 12.4	A-SSE.1	B2,4	A2,5	Technology Technical Skills	PLTW Assessment s
Students will demonstrate their understanding of concepts with projects that implement combinational logic in the design of electronic circuitry in devices.	SCPA11 SCC01 SCPA01 SCC10 SCPA10	ST1,2,4,5 ST- ET1,2,3,4,5 ,6	RL.11- 12.4 SL.11- 12.4 L.9-10.4 L.11- 12.1A RST.9- 10.8	S-ID.9	B2,3,4	A2,5	Technology Technical Skills Health & Safety Work Habits Planning	PLTW Assessment s

Instructional Resources

**List the major instructional resources used for this course: (websites, textbooks, essential equipment, reference materials, supplies)
High School Engineering**

Pathway To Engineering (PTE) curriculum is designed as a four-year high school sequence. Foundation courses (Introduction to Engineering Design, Principles of Engineering, and Digital Electronics) are supplemented by a number of electives to create eight rigorous, relevant, reality-based courses. PLTW (Project Lead The Way) is supplemental to course objectives.