DISTRICT NAME: Matanuska Susitna Borough School District

CTE Course Description and Standards Crosswalk

Course Information	
Course Name	Advanced Robotics
Course Number	84740
Number of High School Credits	.5
Sequence or CTEPS (You must first have the Sequence or CTEPS entered into the EED-CTE system.)	Computer Science Technologies
Date of district Course Revision	May 2017
Career & Technical Student Organization (CTSO)	
CTSO embedded in this sequence	Skills USA
Occupational Standards	
Source of Occupational Standards	ISTE
Names/Numbers of Occupational Standards	ISTE 1-6, SCCI Science and Technology
Registration Information	
Course Description (brief paragraph – as shown in your student handbook or course list)	The advanced robotics class is designed to offer students and opportunity to complete a project with instructor guidance in the area of land, water, air, or medical robotics. Each project will involve the designing, construction, programming and presentation/promotion of their final robotics project. All projects will be based on a common grading rubric that will encompass Science, Technology, Engineering, Math and Language Art standards.
Instructional Topic Headings (please separate each heading by a semi-colon)	Safety in a Lab, Mechanisms and simple Machines, Apply engineering, math and science principles, troubleshoot problems, Program robots, Voice Recognition, Build models, Career exploration
Summative Assessments and Standards	
Technical Skills Assessment (TSA)	No
Course addresses:	
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
Tech Prep	
Current Tech Prep Articulation Agreement? (Y/N)	No
Date of Current Agreement	
Postsecondary Institution Name	
Postsecondary Course Name	
Postsecondary Course Number	

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# of Postsecondary Credits	

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Additional CTE Course Information

Author	
Course developed by	
Course adapted from	
Date of previous course revision	n/a
Course Delivery Model	
Is the course brokered through another institution or agency? (Y/N)	N

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
Apply safe behavior and practices in a laboratory environment.	ISTE1,2b, 4 SCCI SCC06	ST3, 6	L.9-12.6 RST.9-12.1, 4	MP 1, 5, 6, 7	B2, 4	A2, 5, 6	Technical Skills Health/Safety Labor	Class Observation
Identify mechanisms and give examples their operation in simple machines.	ISTE1, 4, 5, 6, 7 SCCI SCPA 01, 03, 10	ST1, 2, 6	L.9-12.6 RST.9-12.1, 4	MP 1, 5, 6, 7	B2, 4	A2, 5	Technical Skills	Class Observation & Discussion
Apply math and science to develop robotics solutions to design problems.	ISTE1, 4, 5, 6, 7 SCCI SCPA 01, 03, 10	ST1, 6 ST-SM1, 2, 3, 4	L.9-12.6 RST.9-12.1, 4	MP 1,2,3,4 5, 6, 7,8	B2, 4	A2, 5	Technical Skills	Class Observation & Discussion Project
Apply the engineering/design process to solve problems.	ISTE1, 4, 6, 7 SCCI SCPA 01, 03, 10	ST1, 2, 6 ST-ET1, 3, 5	L.9-12.6 RST.9-12.1, 4	MP 1, 5, 6, 7	B2, 4	A2, 5	Technical Skills	Class Observation & Discussion Project

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Predict and practice troubleshooting techniques to resolve malfunctions.	ISTE1, 4, 6, 7 SCCI SCPA 01, 03, 10	ST1, 2, 6	L.9-12.6 RST.9-12.1,3, 4	MP 1, 5, 6, 7	B2, 4	A2, 5	Technical Skills Planning Work Habits	Class Observation & Discussion Project
Program robots to understand data acquisition, data handling, and conversation.	ISTE1, 4, 6, 7 SCCI SCPA 01, 03, 10, 11	ST1, 2, 6	L.9-12.6 RST.9-12.1,3, 4	MP 1, 5, 6, 7	B2, 4	A2, 5	Technical Skills	Class Observation & Discussion Project
Employ voice recognition/synthesis, vision systems, and interfacing techniques.	ISTE1, 4, 6, 7 SCCI SCPA 01, 03, 10, 11	ST1, 2, 6	L.9-12.6 RST.9-12.1, 4	MP 1, 5, 6, 7	B2, 4	A2, 5	Technical Skills	Class Observation & Discussion Project
Build models that simulate robots at work. Anticipate design flaws and redesign to avoid errors.	ISTE1, 4, 6, 7 SCCI SCPA 01, 03, 10, 11	ST1, 2, 6	L.9-12.6 RST.9-12.1, 3,4	MP 1, 5, 6, 7	B2, 4	A2, 5	Technical Skills Planning	Class Observation & Discussion Project
Investigate the robotic profession and related careers.	ISTE1, 2, 4, 6, 7 SCCI SCC 09	ST1, 2, 6	L.9-12.6 RST.9-12.1, 4	MP 1, 5, 6, 7	B2, 4	A1-7 B1-5	Technical Skills Work Habits Labor Community Planning	Class Observation & Discussion Project
Write, develop, and present technical reports and a threaded case study.	ISTE1, 3, 4, 6, 7 SCCI SCPA 01, 03, 10	ST1, 2, 6	L.9-12.6 RST.9-12.1,3, 4 WHST9-12.4, 7, 8, 9	MP 1, 5, 6, 7	B2, 4	A2, 5	Technical Skills Planning	Class Observation & Discussion Project
Record predictions, observation, and data in notebook. Compare and contrast predictions and observations, to evaluate design and function of the robot.	ISTE1, 3, 4, 6, 7	ST1, 2, 6	L.9-12.6 RST.9-12.1,3, 4	MP 1, 5, 6, 7	B2, 4	A2, 5	Technical Skills Planning	Class Observation & Discussion

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	SCCI SCPA 01, 03, 10		WHST9-12.4, 7, 8, 9					Project

Instructional Resources

List the major instructional resources used for this course: (websites, textbooks, essential equipment, reference materials, supplies)
Materials:
Tetrix Classroom bundle with Lego Mindstorms
Samantha Wi-Fi Communications Module
Logitec F130 Controller
Other Materials – project dependant

Programs: Labview and/or RobotC

Curriculum: Building Bots by William Gurstelle
Underwater Robotics: Science, Design & Fabrication by Steven Moore
Autonomous Flying Robots by Kenzo Nonami