



Journey Middle School

217 Celtic Drive, Madison, Alabama 35758

Automation + Robotics - 7th and 8th Grade Thomas

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Classroom Digital Platforms	Webpage Link: https://www.madisoncity.k12.al.us/Domain/2880 Schoology Link: Semester 1 - https://madisoncity.schoology.com/course/7360351494/materials Semester 2 - https://madisoncity.schoology.com/course/7360351499/materials Distribution List Link: https://forms.gle/DABY9rwjgPhdD9T3A
Textbook Information	Curriculum is through myPLTW.org.
Course Description	18 Weeks Course Students will apply the design process to solve problems and understand the influence of creativity and innovation in their lives. By working in teams, students will work on designs of various projects from local businesses and learn how to create ideas for their engineering notebooks. Students will create designs in their engineering notebooks and learn how to build and program real-world objects such as traffic lights, toll booths, and robotic arms. Students will be using VEX Robotics equipment to build their designs.
Course Prerequisites	None
Course Objectives	PLTW Automation and Robotics is a 18-week, STEM unit of study. The focus of this unit is the development of automation and robotics and their use to improve daily life. Students investigate mechanical systems, motion transfer, machine automation, and computer control systems. Using the VEX® Robotics platform, students design, build, and program real-world devices, such as food dispensers, robot pet companions, and transport systems.
Course Goals	By the time the course is finished, students will be able to: <ul style="list-style-type: none"> - Describe the purpose of automation and robotics and their effect on society. - Use the characteristics of a specific mechanism to evaluate its purpose and applications. - Apply knowledge of mechanisms to solve a unique problem for speed, torque, force, or type of motion. - Know how to use ratio reasoning to solve mechanical advantage problems. - Design, build, wire, and program both open- and closed-loop systems. - Use motors and sensors appropriately to solve robotic problems. - Troubleshoot a malfunctioning system using a methodical approach
Instructional Delivery Plan, Course Outline, and Culminating Project	Unit 1: Automated Systems (Project 1.9 Design Challenge) Students explore how gear trains and other mechanisms transfer movement in mechanical systems and design, build, and program automated systems to meet the

needs of clients. In the end-of-lesson project, students can choose to design an interactive device to keep pets physically and mentally active, a spinning street sign to warn drivers to slow down and stop, or a high-speed dragster.

Unit 2: Sensors and Systems (Project 2.5: Helping Hand)

Students investigate the versatility of an optical sensor as a programmed input device. Students extend their knowledge of mechanisms as they design increasingly complex prototypes to serve the needs of users. In the end-of-lesson project, students connect inputs to outputs through programming to create effective solutions that help their communities.

Unit 3: Create and Automate (Problem 3.1 Show Your Skills)

Students design solutions using an automated mechanical system and the programming necessary for communication between the sensors, motors, and building components. Students pick their own problems or select problems that highlight their creativity and are of service to others. Throughout the unit students reflect on their growing skills and interests and explore careers in the field.

Course Outline

Week 1 - Lesson 1: Automated Systems
Week 2 - Lesson 1: Automated Systems
Week 3 - Lesson 1: Automated Systems
Week 4 - Lesson 1: Automated Systems
Week 5 - Lesson 1: Automated Systems
Week 6 - Lesson 1: Project Design Challenge
Week 7 - Lesson 2: Sensors and Systems
Week 8 - Lesson 2: Sensors and Systems
Week 9 - Lesson 2: Sensors and Systems
Week 10 - Lesson 2: Sensors and Systems
Week 11 - Lesson 2: Sensors and Systems
Week 12 - Lesson 2: Project Helping Hand
Week 13 - Lesson 3: Create and Automate
Week 14 - Lesson 3: Create and Automate
Week 15 - Lesson 3: Create and Automate
Week 16 - Lesson 3: Create and Automate
Week 17 - Lesson 3: Create and Automate
Week 18 - Lesson 3: Create and Automate

**This is subject to change.*

Credentials

None

**CTSO Integration
(JMS Career Technical
Student Organization
is TSA)**

Technology Student Association, TSA, is a **career technical student organization** and a fundamental part of this course. It is a national career and technical student organization of students engaged in science, technology, engineering, and mathematics (STEM). TSA is integrated into the program which includes competitions and leadership opportunities. TSA provides students with activities during their class time and after school with our local TSA Chapter. *TSA Based Activities relevant to CSIM include but are not limited to: Lab Safety Posters, Coding Challenges, Career Prep, Cyber Security, Essays on Technology, Challenging Tech Issues*

<p>Embedded Numeracy Anchor Assignment (Lesson 1 Project: Purposeful Design)</p>	<p>MA19.6.23 - Calculate, interpret, and compare measures of center (mean, median, mode) and variability (range and interquartile range) in real-world data sets.</p> <p>MA19.6.23a - Determine which measure of center best represents a real-world data set.</p> <p>MA19.6.23b - Interpret the measures of center and variability in the context of a problem.</p>
<p>Embedded Literacy Anchor Assignment (Lesson 2 Project: Helping Hand)</p>	<p>ELA21.6.7 - Produce clear, coherent narrative, argument, and informative/explanatory writing in which the development, organization, style, and tone are relevant to task, purpose, and audience, using an appropriate command of language.</p> <p>ELA21.7.7b - Write informative or explanatory texts with an organized structure and a formal style to examine ideas or processes effectively while developing the topic and utilizing appropriate transitions, precise vocabulary, and credible information or data when relevant.</p>
<p>Embedded Science Anchor Assignment (Lesson 2 Project: Helping Hand)</p>	<p>SC15.8.8 Use Newton’s first law to demonstrate and explain that an object is either at rest or moves at a constant velocity unless acted upon by an external force (e.g., model car on a table remaining at rest until pushed).</p>
<p>CTE Lab Safety Guidelines</p>	<p>Each student in a CTE/PLTW course will be required to complete a lab safety exam and score 100% correct before being allowed to use any tools on projects. We expect students to responsibly and safely use the CTE equipment. Examples of equipment used in CTE courses may include and are not limited to the following: scissors, hot glue guns, box cutters, power tools, hand tools, measuring tools, electronic equipment, computers, medical supplies, adhesives, robotics equipment, food items (consumable and non-consumable).</p>
<p>Classroom Expectations</p>	<ol style="list-style-type: none"> 1. Be prepared to learn each day. 2. Bring necessary materials to class each day. 3. Treat yourself and others with respect. 4. Respect the belongings and personal space of others. 5. Be responsible for all technology and supplies. 6. Set high expectations for yourself. 7. Follow all district-level, school-level, and classroom-level policies and procedures.
<p>Progressive Discipline Procedures (JMS Policy)</p>	<p>All progressive discipline will correspond with the Madison City Schools Code of Conduct regarding Class I and II offenses. Class III offenses are a direct office referral.</p> <ul style="list-style-type: none"> ● Warning ● Conference with student with parent notification ● Parent Contact ● Detention ● Referral to administration for repeat Class I violations and initial Class II and III offenses---Consequences determined to be reasonable and appropriate by the school administration.
<p>Cell Phone Procedures</p>	<p>Cell phones and earbuds/headphones will not be allowed to be used during classroom instruction time. Phones and earbuds/headphones will be put away in a location designated by the teacher and placed in silent mode. In secondary schools, students will have access to their phones and earbuds/headphones outside of classroom instruction time, such as between classes and during lunch, but devices should be put</p>

	away when students are in the lunch serving line. Failure to follow these procedures will result in a disciplinary referral to the office.
Grading Policy (MCS Policy)	60% = Assessments (Tests, Essays, Projects) 40% = Daily Grades (Quizzes, Homework, Classwork, and Participation) Testing Days: Tuesdays and Thursdays
Late Work Policy	Late work in CTE/STEM classes will not be accepted due to the brief nature of the classes. Students are expected to follow up with teachers upon return from an excused absence. Students present in class on the day of instruction are expected to turn in all in-class and out-of-class assignments on time.
Make-up Work/Test Policy	Students with excused absences will be allowed to make-up all work within three days of returning to school. It is the student's responsibility to ask for make-up work. Students can get with a classmate or ask the teacher for help. Work that is not made up will become a zero (including tests/quizzes). Many times, missed quizzes and tests can be made up during school.
Technology	Student laptops should not be hard-wired to the network or have print capabilities. Use of discs, flash drives, jump drives, or other USB devices will not be allowed on Madison City computers. Neither the teacher nor the school is responsible for broken, stolen, or lost laptops. Laptops and other electronic devices will be used at the individual discretion of the teacher.
Cheating/Plagiarism	A student who cheats will not receive credit for the work in question. If any other student has cooperated in cheating, that student is also considered to have cheated and will not receive credit. Cheating students will also be subject to the consequences in the disciplinary consequences in Section XXII of this CSC. Cheating is defined to include, but is not limited to: (a) copying someone else's work in or out of class and identifying and submitting it as your own (b) failing to quote and/or list appropriate citations for material derived from published sources (including the Internet) and identifying and submitting it as your own (c) the use of unauthorized notes, other materials, or assistance during the accomplishment of graded work in or out of class (d) any other situation in which the student attempts to or accepts credit for work not his or her own.
Accommodations	Requests for accommodations for this course or any school event are welcomed from students and parents.
Materials & Supplies	JMS Chromebook and Charger Composition Notebook Colored Pencils/Markers Assorted Highlighters Pencils / Pens Glue Stick Individual Headphones / Earbuds with auxiliary jack cord (no wireless) Donations (Optional But Greatly Appreciated!): Index Cards

	Sticky Notes Loose-Leaf Paper Loose-Leaf Graph Paper
Homework	Students are allotted time in class to complete assignments. In the event that a student is absent or does not finish during class time, they will need to complete the assignment for homework.
Parent & Student Acknowledgment Form	<u>Please click to find and complete the Parent / Guardian and Student Syllabus Acknowledgement Form for this class. This form acknowledges that you have read and understand the expectations and procedures of the class. Please contact me with any questions!</u>