



# Liberty Middle School

281 Dock Murphy Drive, Madison, Alabama 35758

## Career Technical Education- Design & Modeling

Mrs. Robinson, Room 114, Purple Pod

<b>Teacher Contact Information</b>	<p>Email: dvrobinson@madisoncity.k12.al.us Classroom Phone: 256-430-0001 ext. 83114</p> <p><b>This syllabus is subject to change. Please initial each page, sign the last page, and return asap. The digital syllabus in Schoology and on my LMS teacher webpage is for your future reference.</b></p>
<b>Classroom Digital Platforms</b>	<p>Curriculum Link: <a href="http://www.pltw.org">www.pltw.org</a> (Access via Clever) Schoology Link: Can be accessed through MCS account Parent Square: Can be accessed through MCS account Distribution List Link: PowerSchool will be used for parent contact info</p>
<b>Required Instructional Materials</b>	<p>Please ensure your students bring their MCS Chromebook charged and ready for class each day.</p> <ul style="list-style-type: none"> <li>Students will access the curriculum via CLEVER from <a href="http://www.pltw.org">PLTW</a>.</li> <li>Students will complete daily assignments and assessments in Schoology and their engineering notebooks (provided by the teacher and stored in the classroom at all times).</li> </ul>
<b>Course Description</b>	<p>Design and Modeling (DM) offers students the chance to creatively tackle problems using the design process. They are introduced to a unit problem and encouraged to connect their lessons to it throughout the unit. Students learn to communicate their design ideas through sketches, solid models, and mathematical representations. They also explore how models can simulate real-life situations to generate data for analysis. Working in teams, students identify design requirements, conduct research, and engage stakeholders to design, fabricate, and test a toy or game for a child with cerebral palsy, making modifications to enhance their solution.</p>
<b>Course Prerequisites</b>	None
<b>Course Objectives</b>	<ul style="list-style-type: none"> <li>Persistently apply an iterative process to solve a problem or create an opportunity that can be justified.</li> <li>Apply user-centered design principles when creating a solution. Solve a problem using computational thinking, analytical, and critical thinking skills.</li> <li>Analyze and describe design functionality by observation of an artifact. Design and conduct an experiment that investigates a question.</li> <li>Collaborate effectively on a diverse and multidisciplinary team.</li> <li>Communicate effectively for specific purposes and settings.</li> <li>Demonstrate the ability to manage multiple resources throughout a project.</li> <li>Identify the variety of careers related to engineering, biomedical sciences, and computer science.</li> <li>Demonstrate personal responsibility and initiative.</li> <li>Apply a mathematical model to represent an authentic situation.</li> <li>Construct a solid model.</li> </ul>
<b>Course Goals</b>	<ol style="list-style-type: none"> <li>Apply the design process to creatively solve problems.</li> <li>Students learn to use methods for communicating design ideas through sketches, solid models, and mathematical models.</li> </ol>

	<ol style="list-style-type: none"> <li>Understand how models can be simulated to represent an authentic situation and generate data for further analysis and observations.</li> <li>Work in teams to identify design requirements, research the topic, and engage stakeholders.</li> <li>Design a toy or game for a child with cerebral palsy, fabricate and test it, and make necessary modifications to optimize the design solution.</li> </ol>
<b>Instructional Delivery Plan, Course Outline, and Culminating Project</b>	<p><b>Lesson 1 (19 Days): Introduction to Design</b>  Students discover the design process as they complete an instant design challenge to create an ankle foot orthosis. They learn thumbnail, orthographic, isometric, and perspective sketching as methods for communicating design ideas effectively without the use of technology. The use of a common measurement system is essential for communicating and fabricating designs. Students use both measurement systems and apply measurement skills while dimensioning sketches. They create and launch paper air skimmers and complete statistical analysis on their results. Students conduct a mechanical dissection in the lesson project to better understand how objects and parts interact while using sketches to communicate and document their findings.</p> <p><b>Lesson 2 (14 Days): Solid Modeling</b>  In this lesson, students transfer a two-dimensional representation to a three-dimensional solid model with technology. Students learn how to use a computer-aided design (CAD) application to create solid models of various objects and designs. During the design project, students work in teams and apply the design process to create a puzzle cube. Students create a solid model of their design using the CAD application and fabricate their design solution for testing. Students use a dynamic mathematics program to complete statistical analysis from their testing results to determine if their design met the criteria and constraints.</p> <p><b>Lesson 3 (7 Days): Design Challenge</b>  Within teams, students brainstorm and select a design solution to the Therapeutic Toy Design Challenge problem based on design requirements. They establish team norms, collaborate, and recognize that solving authentic problems involves interdisciplinary skills such as engineering and biomedical science. Using the design process, students create a solid model of their design, build a prototype for design testing, and make necessary design modifications based on testing results.</p>
<b>Credentialing</b>	None
<b>CTSO Integration (DMS Career Technical Student Association)</b>	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 Design and Modeling include but are not limited to: Inventions and Innovations, Technical Design, and Problem Solving.
<b>Embedded Numeracy Anchor Assignment (Skimmer project data interpretation)</b>	Students will statistically analyze their data by performing calculations to create a summary that describes their data. The data will be described by two features, center (median) and spread (interquartile).
<b>Embedded Literacy Anchor Assignment (Instant Design Challenge)</b>	<p>In this activity you will work in a team of four to solve an instant design challenge. You and your team will use the design brief to understand and define the needs of a person with a physical challenge, then design, build, test a prototype, and draw logical conclusions to help that person. As designers, you will document and explore the steps you use to solve this problem.</p> <p>- Linked on PLTW Standards Page</p>

<b>CTE Lab Safety Guidelines</b>	Each student in a CTE/PLTW course will be required to complete a lab safety exam and score a 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, robotics equipment, food items (consumable and non-consumable).
<b>Classroom Expectations</b>	<ol style="list-style-type: none"> <li><b>Listen carefully and follow directions.</b></li> <li><b>Refrain from distracting others</b> by: <ol style="list-style-type: none"> <li>entering and leaving the room quietly</li> <li>sitting appropriately in your assigned seat.</li> <li>obtaining teacher permission to leave your seat.</li> <li>keeping hands, feet and objects to yourself.</li> <li>raising your hand to speak and waiting to be called upon.</li> <li>not teasing others.</li> </ol> </li> <li><b>Be prepared</b> for class having pencils and your <b>charged laptop</b>.</li> <li>Use class time for working on Design and Modeling assignments only.</li> <li>Keep the area around your desk clean.</li> <li>"Clock in" on time. Students should be seated when the tardy bell rings. <b>Students tardy to class will receive a detention per LMS policy.</b></li> <li>Be honest. Avoid cheating and sharing work. (See Code of Conduct for definition of cheating.)</li> <li>Stay awake and attentive.</li> <li><b>Refrain from chewing gum, eating and drinking in class.</b> Water bottles are permitted.</li> <li><b>Cell phones and all other bluetooth capable devices must be powered down and in a backpack from 8:15 am - 3:20 pm.</b></li> </ol> <p>All students must follow the <a href="#">Madison City Schools Code of Conduct</a>.</p>
<b>Progressive Discipline Policy (LMS Policy)</b>	Support will be provided to assist student in making good decisions that result in positive educational outcomes.
<b>Technology &amp; Cell Phone/Digital Device Procedures</b>	Effective July 1, 2025, the use, operation, or possession of Wireless Communications Devices including but not limited to cellular telephones, tablet computers, laptop computers, pagers, gaming devices, smart watches, earphones or headphones in school buildings or on school grounds during the Instructional Day, is prohibited. Violation of Board policy with respect to such use, operation, or possession of Wireless Communication Devices will constitute a Class II violation. Madison City Schools has outlined an Electronic/Wireless Device Policy (Policy 6.20) on page 137 of the MCS Policy Manual.
<b>Progressive Discipline</b>	<p><b>Liberty Middle School Classroom Management Plan:</b></p> <p><b>Step 1:</b> Verbal warning</p> <p><b>Step 2:</b> Student/teacher conference with parent notification</p> <p><b>Step 3:</b> Parent contact/conference</p> <p><b>Step 4:</b> Detention</p> <p><b>Step 5:</b> Referral to administration for repeat Class I violations and initial Class II and Class III offenses</p> <p><b>Note that per the Madison City Schools Code of Conduct, some offenses result in immediate detention of referral to administrator's office.</b>  <a href="#">(Madison City Schools Code of Conduct)</a></p>
<b>Grading Policy (MCS Policy)</b>	<p><b>60%</b> = Assessments (Projects and Tests)</p> <p><b>40%</b> = Daily Grades (Quizzes, Homework, Classwork, and Participation)</p> <p><b>Grade Scale:</b> 90-100 = A; 80-89 = B; 70-79 = C; 65-69 = D; &lt;64 = F</p>

<b>Late Work Policy</b>	<b>Late assignments will be reviewed and considered on an individual basis. As CTE/STEM courses simulate real-world work environments and emphasizes project-based learning, timely completion of tasks is essential. However, if circumstances arise, students are responsible for communicating with the teacher emulating positive employability traits; each situation will be assessed fairly and thoughtfully.</b>
<b>Make-up Work/Test Policy (MCS Policy)</b>	Students with excused absences will be allowed to make-up all work within three days of returning to school. Make-up assignments are the student's responsibility. Work that is not made up will become a zero (including quizzes/tests). Students will not receive credit for and will not be allowed to make up any assignments, tests, work, activities, etc., missed during unexcused absences. ( <a href="#">Madison City Schools Code of Conduct</a> )
<b>Technology</b>	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.
<b>Materials &amp; Supplies</b>	<b>Students should come to class daily prepared with a fully charged Chromebook, pencils, and black pens. All other materials for the class will be provided.</b>  Students should have all materials listed on the LMS Website.
<b>Homework</b>	All work is designed to be done in class. Any work at home is usually due to an illness, incompleteness, or extenuating circumstances.

*This syllabus is subject to change.*

**PLEASE SIGN AND RETURN THE NEXT PAGE.**

## Acknowledgment Statement of the updated syllabus for Design and Modeling.

**After reading this syllabus and reviewing it in detail with your scholar, please detach and return this page only.**

We, the undersigned, acknowledge that we have read and understood the syllabus for this class. We agree to support our student's learning and abide by the policies outlined.

Student Name: \_\_\_\_\_ Signature of Student: \_\_\_\_\_ Date: \_\_\_\_\_

Parent/Guardian Name: \_\_\_\_\_ Phone Number \_\_\_\_\_

Parent/Guardian Signature: \_\_\_\_\_ Date: \_\_\_\_\_ Email \_\_\_\_\_

Parent/Guardian Name: \_\_\_\_\_ Phone Number \_\_\_\_\_

Parent/Guardian Signature: \_\_\_\_\_ Date: \_\_\_\_\_ Email \_\_\_\_\_

- ☐ I can receive emails to the address(es) listed above regarding my child's grades/behavior.  
☐ I cannot receive emails to the address(es) listed above regarding my child's grades/behavior.

**If you work in a career field or own a business related to any of the course objectives/goals listed above, and would enjoy sharing your expertise with the class, please complete the following.**

**Your Name** \_\_\_\_\_

**Company Name** \_\_\_\_\_

**Job Title** \_\_\_\_\_

**Phone** \_\_\_\_\_

**Email** \_\_\_\_\_

**Your Name** \_\_\_\_\_

**Company Name** \_\_\_\_\_

**Job Title** \_\_\_\_\_

**Phone** \_\_\_\_\_

**Email** \_\_\_\_\_