

Engineering: Gateway to Technology (Project Lead the Way) Syllabus

Montgomery Village MS 19300 Watkins Mill Road

Montgomery Village, MD 20886

301-840-4660

Instructor: Mr. Augustine Kang

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Welcome to Gateway to Technology! I am excited to have the opportunity to work with you through this new and exciting curriculum! In this class, you will learn the basics to technology and engineering, but look forward to opportunities to really think outside the box and use your creative design to solve real life problems. Watkins Mill High School is the only high school in Montgomery County that implements “Project Lead the Way”, a fully functioning engineering program. This course will expose you to the software and technology used by the Watkins Mill engineering program track and is designed to provide you with a step above your peers who may begin the engineering program at Watkins Mill High School next year. Here are some of the objectives and topics we will be exploring this year!

- Objectives:**
- To expose students to the application of scientific ideas in real world situations, with an emphasis on individual and team work.
 - To expose students to various career fields/options in engineering at an earlier age in order to be better prepared for high school and college.
 - To provide students the opportunity to engage in the scientific process when solving real world problems.
 - To develop skills in the use design software such as Envisioneer and Inventor, as well as everyday programs such as Microsoft Word, PowerPoint, and Excel.

Units of Study:

1. Design and Modeling :

Students use solid modeling (sophisticated mathematical technique for representing solid objects) to introduce the design process. Utilizing this design approach, students understand how solid modeling influences their lives. Students learn sketching techniques, use descriptive geometry as a component of design, measurement, and ultimately make use of computer modeling in order to solve real world problems, including the design of boats and structures.

2. The Science of Technology:

Students research and share the various branches of engineering that are being studied in everyday occupations. Students trace how science has affected technology throughout history by learning about the mechanics of motion, conversion of energy, and the use of science to improve communication.

3. The Magic of Electrons:

Students explore the science of electricity, magnetism, the movement of electrons, circuit design, and sensing devices by acquiring knowledge and skills in basic electricity, magnetism, and circuitry design. They will attempt to design and construct a working model Mag Lev train.

4. Automation and Robotics:

Students trace the history and development of automation and robotics through the study of robotic structures, energy transfer, machine automation, and computer control systems. They will apply the ideas of basic automation and robotics to construct their own robots, and develop basic programs for the robot to accomplish a given task.

GRADING POLICY

Students' academic grades are based on individual academic achievement. Quarter grades will be determined using a scale of: A: 90% - 100%, B: 80% - 89%, C: 70% - 79%, D: 60% - 69%, E: 59% or lower. We will use an array of tools to assess student learning.

Category	Weight	Description
Summative Assessments/ Unit Assessments	25%	Portions or entire Assessment may NOT be retaken. Examples of Summative Assessments include end of unit tests, and culminating projects, and culminating labs.
Formative Assessments	65%	Teacher determines which assessments can be retaken* and will notify students before the assessments. The assessment can be retaken only once. Students must complete required activity(ies) as determined by the Science Department. Examples of Formal Assessments include labs, quizzes, reading and writing assignments, journal entries, warm-ups, exit cards, quizzes, class work, homework evaluated for learning, etc.
Practice/ Prep Homework	10%	Any assignment (textbook assignments and/or worksheets) assigned for practice or preparation for instruction.

MVMS uses the “raw score conversion to percentage” method to calculate grades. Therefore, the # of points a particular assignment is worth does not impact its weight within a category (18/20 carries the same weight as 36/40). However, assignments may still be weighted within categories by assigning weights to specific assignments.

Range of Weights for formative and summative assessments (i.e. quizzes = 2-3, lab reports = 2-3, exit card = 1, or other assignments as determined by the teacher). **No extra credit will be assigned.**

Reassessment of Student Work: *Reassessment grade replaces the original grade.*

- Assessed tasks may be revised to receive a higher grade until the end of a lesson sequence.
- The reassessment grade replaces the original grade even if the reassessed grade is lower.
- Reteaching / relearning activities are determined by the teacher and must be scheduled within the instructional time.
- Assessments may be reassessed partially, entirely, or in a different format.

Late Assignments: (Due dates / Deadlines - this will be determined in advance by the classroom teacher)

- Each assignment will have a **due date**. This is the date by which you are expected to submit the assignment. Your grade may drop one letter grade if it is not turned in by the due date.
- The **deadline** is the last day an assignment will be accepted for a grade. Work not turned in by the deadline will be considered missing and receive a 0%. Assignments that are completed and meet minimum standard (as indicated by the Science Department), will earn a minimum grade of 50%.

Learning Skills Grades:

In addition to the academic grade, students will receive *Learning Skills Grades* each quarter as well. Learning skills grades will assess students' Participation and Assignment Completion throughout the course. Students may earn the following grades for each of the aforementioned categories:

C: Consistently **O:** Often **S:** Sometimes **R:** Rarely **NI:** Not Enough Information

HOMEWORK and EDLINE

A set time to complete homework is a good way to help in establishing a priority at home. You can expect homework two or three times a week. You will be required to keep track of your assignments (due dates and deadlines) in your Mustang Data Notebook.

****Additionally, students and parents should visit Edline daily for posted assignments and daily grade updates (www.edline.net). Students are expected to know their grades, and what, if any, work is missing at all times. There should be no surprises about grades to students or parents; if so, please make sure you contact me.****

It would be extremely helpful to enter an active email address in both student and parent Edline accounts. If you need an Edline activation code, please contact Ms. Marable at Alice_Marable@mcpsmd.org.

Suggested Student Organizational Tools and Supplies (recommended supply list)

There will be no fees for this course.

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|---|-----------------------|------------------------|
| - 3-ringed binder (Section for Science) | - Notebook paper | - Pens (black or blue) |
| - Calculator (inexpensive one to be kept in binder) | - Tissues | - Colored pencils |
| - Marble journal notebooks | - Pencils and Erasers | - Highlighter |



CLASS EXPECTATIONS

- All students will be required to follow safe computer use procedures as designated by the MVMS Safe Computer Use Guidelines. Failure to follow the safety guidelines may result in loss of computer privileges or dismissal from the computer.
- A separate sheet regarding classroom procedures, expectations, and disciplinary actions, will be provided separately and must also be signed by parents.



COMMUNICATION

One of the most useful ways we have to communicate is your child's data notebook. Please check this daily for information. I can also be reached by email (Augustine_Kang@mcpsmd.org) or by calling the school (301-840-4660). In addition, please check Edline regularly to know if you are missing work (other communication: progress reports / interims, report cards, scheduled conferencing).

****Please sign this paper below to indicate that you have read and understand these guidelines. Review these guidelines with your parent / guardian and have them sign them to indicate that they also understand the general course description of this class.****

Student Print Name _____

Student Signature _____

Parent Print Name _____

Parent Signature _____

Approved:

Mr. Augustine Kang – Science/Technology Content Specialist

Dr. Tiffany Awkard - Assistant Principal

Dr. Edgar Malter - Principal