

8th Grade GTT-DM & AR
Sharyland North JR. HIGH
2019-2020

Instructor: Khaleda P. Bhatti

Office: 5100 Dove Ave, Rm. # 122

Phone: 686-1415 (Ext: 3496)

HW website: www.Sharylandisd.org

E-Mail: Use "Contact Me" Tab on my web page

Class Schedule: Monday-Friday

1st-Dept. Head Conference

2nd-GTT-DM & AR

3rd-Regular Sci.

4th-IPC

5th-IPC

7th-IPC

8th- Conference

9th-IPC

TUTORING: MONDAY-THURSDAY

4:00PM-4:30PM

Room # 122

Academic dishonesty will result in a grade of F.

CHAPTERS AND CH. SECTIONS WILL BE COMBINED TO FORM THE UNITS NOT ALL
CHAPTERS/SECTIONS WILL BE COVERED

1st 6 weeks (August 19-September 27)

Gateway To Technology - Introduction Overview

Unit 1: Design & Modeling (DM)-40 Days

Lesson 1.1 - What is Engineering?-5 Days: *It is expected that students will:*

- Utilize standard procedures to use and maintain an engineering notebook.
- Use guidelines for developing and maintaining an engineering notebook to evaluate and select pieces of one's own work for inclusion in a portfolio.
- Describe the relationship between science, technology, engineering, and math.
- Identify the differences between invention and innovation.
- Operate as an effective member of a team to complete an investigation.
- Describe engineering and explain how engineers participate in or contribute to the invention and innovation of products.
- Describe impacts that technology has had on society.

Lesson 1.2 - Design Process-5 Days: *It is expected that students will:*

- Describe the design process and how it is used to aid in problem solving.
- Describe the elements of design.
- Recognize design criteria and constraints.
- Describe the purpose and importance of working in a team.
- Use the design process to solve a technical problem.
- Apply the elements of design to the design process.
- Explain a design brief and apply the concept when using the design process.
- Operate effectively as a member of a team to complete a design project.
- Use a decision matrix to select the best solution to a design.

Gateway To Technology - Design and Modeling Overview

Unit 1: Design and Modeling

Lesson 1.3: Measurement-5 Days: It is expected that students will:

- Select the appropriate value from a conversion chart to convert between standard and metric units.
- Convert between standard and metric measurements including inches, feet, yards, millimeters, centimeters, and meters.
- Demonstrate the ability to measure accurately with different devices and scales using both the standard and metric systems.

Explain how to measure in different contexts.

Lesson 1.4: Sketching and Dimensioning-5 Days: *It is expected that students will:*

- Summarize the reasoning for using sketching as a communication tool.
- Use visualization, spatial reasoning, and geometric shapes to sketch two and three dimensional shapes.
- Recognize thumbnail, perspective, isometric, and orthographic sketches.
- Recognize one and two point perspective drawings.
- Create thumbnail, perspective, isometric, and orthographic sketches.
- Accurately interpret one and two point perspective drawings.
- Communicate ideas for a design using various sketching methods, notes, and drafting views.
- Dimension an orthographic sketch following the guidelines of dimensioning.

2nd 6 weeks (October 01-November 08)

Teacher Prep Day: 09/30/2019; Columbus Day: 10/14/2019

Lesson 1.5: Designing for Production-20 Days: *It is expected that students will:*

- Describe the coordinate system and how geometric shapes work together to create objects.
- Create a three-dimensional (3D) model of an object.
- Apply geometric and dimension constraints to design CAD-modeled parts.
- Assemble the product using the CAD modeling program.
- Demonstrate the ability to produce various annotated working drawings of a 3D model.
- Identify the difference between a prototype, a model and a mock-up.
- Analyze what circumstances call for the use of a prototype, a model, and a mock-up.
- Describe why teams of people are used to solve problems.
- Brainstorm and sketch possible solutions to an existing design problem.
- Create a decision-making matrix.
- Use a decision making matrix to select an approach that meets or satisfies the constraints given in a design brief.

Unit 2: Automation and Robotics (AR)-40 Days

Lesson 2.1 What is Automation and Robotics?-5 days: It is expected that students will:

- Describe the purpose of automation and robotics and its effect on society.
- Summarize ways that robots are used in today's world and the impact of their use on society.
- Describe positive and negative effects of automation and robotics on humans in terms of safety and economics.
- Provide examples of STEM careers and the need for these professionals in our society.

Lesson 2.2 Mechanical Systems-12 days: *It is expected that students will:*

- Use ratios to solve mechanical advantage problems.
- Use numerical and algebraic expressions and equations to solve real-life problems, such as gear ratios.
- 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.

3rd 6 weeks (November 12-December 20)

Teacher Prep Day: 11/13/2019

Thanksgiving Break (Nov. 25-29) & Christmas Break (Dec. 23-Jan. 06)

Lesson 2.3 Automated Systems-23 days: *It is expected that students will:*

- Know the seven technological resources and how they are integrated into an open and closed loop system.
- Describe the purpose of pseudocode and comments within a computer program.
- 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.
- Experience fluid power by creating and troubleshooting a pneumatic device. (FT Version)
- Design, build, wire and program a system operated by alternative energy. (FT Version)
- Explain the roles and responsibilities of mechanical, electrical, and computer engineers who solve robotic problems.

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Course Description

- **General requirements:** Students shall be awarded 1/2 credit for successful completion of this course. Prerequisites: Algebra 1/2. This course is recommended for students in Grades 8 who are currently enrolled in Algebra 1.
- An engineering notebook is used to record original ideas or designs and to document the design process related to an invention or innovation.
- A portfolio is an organized collection of best works.
- Science is the study of the natural world, while technology is the study of how humans develop new products to meet needs and wants.
- Teams of people can accomplish more than one individual working alone.
- Technological change is seen through inventions, innovations, and the evolution of technological artifacts, processes, and systems.
- Technology can have positive and negative social, cultural, economical, political, and environmental consequences.
- Engineers, designers, and engineering technologists are needed in high demand for the development of future technology to meet societal needs and wants.
- Many different design processes are used to guide people in developing solutions to problems.
- The design brief is a tool for defining the problem; it is an agreement between the engineer and client.
- Engineers use design briefs to explain the problem, identify solution expectations, and establish project constraints.
- Design teams use brainstorming techniques to generate large numbers of ideas in a short amount of time, striving for quantity, not quality.
- A decision matrix is a tool used to compare solution ideas to the criteria so that you can select the best solution.
- In the United States, we use both Standard and Metric systems of measurement.
- Being able to measure accurately is important at school and at home, at work and when pursuing hobbies.
- Precision measuring tools are needed for accuracy, but tools must be used correctly to ensure accurate measurements are taken.
- Quality workmanship and accurate measurements with precise instruments are necessary to successfully solve problems.
- The ability to create a rapid, accurate sketch is an important skill to communicate ideas.
- Orthographic drawings of an object are used to provide information that a perspective drawing may not be able to show.
- Engineers apply dimensions to drawings to communicate size information.
- Simple geometric shapes are combined and joined to create a representation of an object.
- Engineers use computer-aided design (CAD) modeling systems to quickly generate and annotate working drawings.
- Three-dimensional computer modeling uses descriptive geometry, geometric relationships, and dimensions to communicate an idea or solution to a technological problem.

- As individual objects are assembled together, their degrees of freedom are systematically removed.
- Engineers use a design process to create solutions to existing problems.
- Teamwork requires constant communication to achieve the goal at hand.
- The fabrication of a prototype is the opportunity for the designer to see the product as a three-dimensional object
- Automation is the use of technology to ease human labor or to extend the mental or physical capabilities of humans.
- Robotics is the specialized field of engineering and computer science that deals with the design, construction, and application of robots.
- The use of automation and robotics affects humans in various ways, both positively and negatively, including their safety, comfort, choices, and attitudes about a technology's development and use.
- Automation and robotics have had an influence on society in the past and present and will influence society in the future.
- Engineers, designers, and engineering technologists are in high demand for the development of future technology to meet societal needs and wants.
- Energy is the capacity to do work; the use of mechanisms is necessary to transfer energy.
- Engineers and technologists design mechanisms to change energy by transferring direction, speed, type of movement, and force or torque.
- Mechanisms can be used individually, in pairs, or in systems.
- Automated systems require minimal human intervention.
- An open-loop system has no feedback path and requires human intervention, while a closed-loop system uses feedback.
- Troubleshooting is a problem-solving method used to identify the cause of a malfunction in a technological system.
- Comments do not change the way a robot behaves, but they do allow the programmer to remember the function that the code performs.
- Invention is a process of turning ideas and imagination into devices and systems.
- Some technological problems are best solved through experimentation.

Required:

- ✓ Engineering Graphing Notebook-Composition book not spiral
- ✓ 1pkg of wide ruled three-hole paper, graph paper, isometric paper, 6-glue sticks, scissors, 3-solid color folders with pockets and brads
- ✓ 1 pkg. Of colored pencils, #2 lead pencils, ball pens red for grading, colored markers, 2 highlighters, compass, protractor, 1 Flash drive, TI-30X calculator
- ✓ Ruler with metric system, pink eraser, and pencil sharpener, Head phone or AirPods; **1 box of Kleenex and 1 bottle of hand sanitizer-2nd period only.**
- ✓ ipad or cell phone with camera & cable with following google apps in a folder: doc, slides, drive, photos, classroom, YouTube, and Remind
- ✓ Students are responsible for all materials presented in class, including announcements about changes in course procedures.
- ✓ Students might have to participate in bringing household materials (for example stock board paper, folders, wooden dowels, .) to be used in lab activities.

Attendance:

- You are responsible for all material presented in class, including announcements about course procedures. Exams, quizzes, and homework often include questions on material presented only in class, so performance on these indirectly reflects attendance. See tutoring schedule above if absent to make up work missed.
- The student is responsible to keep his/her parent(s) informed of their progress in GTT-DM & AR class. Failing class progress reports will be given to any student that is failing at mid six weeks period. It is the student's responsibility to have the parent review and sign the progress report.
- Student is responsible to keep Engineering Notebook. The Engineering Notebook will include all information concerning school and class rules/regulations. The Engineering Notebook will help the student to be organized with all assignments for GTT-DM & AR class and will be graded and required whenever a teacher/student/parent conference is held. This Engineering Notebook will be given to high school engineering teacher at the end of semester.
- **Parents are encouraged to call the teacher for a conference when they receive the three-week failing progress report from both the teacher and the school. A failing progress report will be sent home with the student during the fourth/fifth week of each six weeks if the student is in danger of failing the class.**
- **Student is responsible for flash drive & other devices. Please back up your work at two different places. If lost, student must inform teacher immediately.**

Homework:

Students are required to spend 30-50 minutes each day for assigned homework.

Classroom and Lab Policies & Procedures

A. Major Assignments: 60%

I. Tests/Projects:

- A. Test will be given upon completion of a chapter or unit.
- B. Ample time will be allowed in class to review the test.
- C. Reteaching and retesting will be done according to District/school policy.
- D. Retesting does not apply to class work, homework, lab work, projects, and quizzes.

B. Minor Assignments: 40%

II. Class work & Homework:

- A. Class work & Homework may include any other activity the teacher chooses to label as Class work.
- B. Assignments are due at the beginning of the class.
- C. Late work will be accepted according to district's grading policy.
- D. The policy for accepting the late work due to excused absences follows the District/school policy.

III. Lab work & Quizzes:

- A. Detention or lab grade of a "0" may be given for not following the lab safety rules.
- B. Students are not allowed to break or damage the lab equipment. If they do so, they may require replacing the equipment/Detention or office referrals may be assigned also.
- C. Students are recommended to notify the teacher for planned absences.

IV. Notebooks:

- A. Engineering Notebook
- B. Notebooks will be graded for completeness, neatness, and organization.

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It is recommended that you record names and phone numbers of at least two other class members:

Friends' Name and Phone #:

1. _____

2. _____

Parent's Signature:

Remind

What is Remind?

Remind is a simple way for you to stay informed and up-to-date with what's happening in your class. By joining your teacher's class on Remind, you're choosing to receive class messages via push notifications, SMS, or email. Don't worry because your phone number will not be shared with the teacher or anyone else in the class. Remind also generates a number for the teacher to use so their number stays private as well. I highly recommend you join your class so you don't miss out on important announcements or reminders. Be sure to join the correct class Science or IPC or GTT or TMSCA. If you need assistance signing up or have any questions please feel free to contact me. Follow these steps to join Science or IPC or GTT or TMSCA class:

Join via text:

- Science students enter this number 81010 or (956) 233-7959 with message @msbhatt
- **IPC students enter this number 81010 or (956) 233-7959 with message @20430**
- **GTT students-Fall Sem enter this number 81010 or (956) 233-7959 with message @41aa1**
- **TMSCA students enter this number 81010 or (956) 233-7959 with message @tmscas**

Join via email:

- Science students send e-mail To: msbhatt@mail.remind.com or go to rmd.at/msbhatt to sign up
- **IPC students send e-mail To: 20430@mail.remind.com or go to rmd.at/20430 to sign up**
- **GTT students-Fall Sem send e-mail To: 41aa1@mail.remind.com or go to rmd.at/41aa1 to sign up**
- **TMSCA students send e-mail To: tmscas@mail.remind.com or go to rmd.at/tmscas to sign up**

Parents please check off the corresponding box and sign to authorize your child to receive these notifications.

- I do give permission for my child to participate in Remind messaging.
- I do not give permission for my child to participate in Remind messaging, should my child sign up without my permission I will not hold Ms. Bhatti accountable.

Student Name (print): _____ Signature: _____

Parent Name (print): _____ Signature: _____

Date: _____ Class Pd: _____ Subject: _____