

2020-2021 CAD & Engineering Technology

Academic Essential Skills

Reading	Students will be reading technical information as it pertains to the computer-aided drafting and engineering field. Grade-level reading ability is suggested, as there is frequent reference/use of scientific names and technical terms. The ability to read technical and procedural documents is required. Students should also be able to read and gather information from pamphlets, bulletin boards, computer programs, etc.
Writing	Grade-level writing ability is suggested. There is frequent writing, journaling of scientific observation, technical writing, research and response papers, communication between multiple areas using notes incorporated with engineering drawings, writing to express our knowledge of the subject and to create step-by-step directions that can be used to teach others.
Math	Students will be learning and using geometry as it applies to the creation of drawings. Geometric construction is the use of geometry to correctly create shapes and calculate mass and areas of objects. Students need to be able to measure and there is frequent use of the metric system. They also need to use algebra/geometry, and have the ability to convert fractions and decimals, and ounces and pounds. Students will also learn the practical math used in industry and job placement.
Memorization/Note Taking	Students will be creating a journal that includes notes and project work to document success and failure of projects and experiments including calculations for ongoing projects. The ability to take notes and memorize information is helpful. We will be learning the use of multiple note-taking skills that help students retain the information that is given, and allow them to better use that information on their given projects and assessments.
Science	Two years of high school science is recommended. This course includes all of the physics standards, and any other science related to STEM programs.

Physical Skills

Physical Requirements	Student will be working with equipment and computers. Most of our time is spent in the CAD lab creating drawings that can be used in the creation of parts. Students should be able to be in an outdoor environment for labs, sometimes in challenging weather conditions. They should be able to lift heavy objects because physical labor in the lab setting is possible. Students will be working with many different types of materials and equipment, based on project needs
Clothing/Special Equipment	Students will be working in many different environments, such as the auto, welding, machine tool, and other "dirty" labs in which there are clothing restrictions and safety requirements. Long pants and close-toed shoes will be required in the lab at all times. Use of Personal Protection Equipment (PPE) will be directed.
Fine Motor Skills/Coordination	Students must possess the ability to keyboard and control a mouse. They will be required to work with their hands to build prototypes and models. Students will also be working with small electrical and mechanical parts and equipment.
Spatial Awareness	Student must possess the ability to visualize three-dimensional shapes, lines, and angles and their relationship to each other.

Other Requirements

Medical Requirements	Students must be able to work for long periods of time at a computer. They should also have the ability to lift some heavy objects (30 pounds).
Related Interests	Science, Technology, Engineering, & Math (STEM), drafting, arts (STEAM), and problem-solving
Transportation	N/A
Certification/Licensure	Students will have the ability to earn an AutoCAD Certification, Solidworks CSWA Certification, and the AP Computer Science credit.
Homework	Students will work on a computer, so a home computer may be helpful. CAD softwares are the main programs used in this program. Students may possibly download a free student version of the software for use at home. The course requires research and design elements that require work outside of class.
Classroom Instructional Methods/Time	25% lecture, 25% guided practice, 50% lab/work time. Students may be traveling to events, business visits, college & universities field trips, and competitions

Additional Information

A demonstrated pattern of regular attendance is critical to student success. It is difficult to complete work outside of class due to software requirements.

The student will be working in many environments and may be getting "dirty" in the shop, or in collaborative work with other programs at the MACC. The class may also meet outdoors for some projects, and there are after school and weekend events that students will be asked to help participate in.

Students must be able to work cooperatively as a member of a team. Students must also possess the ability to work independently with the ability to meet deadlines.

The class guides students from basic drafting all the way through 3D prototype modeling using the latest CAD software. Students with more experience may also engineer some of their projects.

This is a project-based class in which students are expected to use prior knowledge from core classes and apply it to work-world situations. Students will create personal portfolios upon completion of the course.

Articulated college credits are also available at some post-secondary institutions.

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