TECHNOLOGY EDUCATION

COMMON CORE ELECTIVES

BASIC DRAFTING: 9, 10, 11, 12 **2.5 or 5 credits**

The Basic Drafting class introduces the student to the processes and techniques of the exciting world of drafting and design. It enables students to experience first hand the drawing process that Architects, Engineers and Designers use in their careers. Students will learn how to freehand sketch an object, then produce an accurate scale drawing that can be used to manufacture it. With the use of the latest Computer Aided Drafting (CAD) software, AutoCAD, students will generate 2D drawings as well as 3D pictorials. This course offers life skills in sketching, designing and reading drawings that can be used by professionals in industry and future homeowners. This course is designed for both male and female students and can be taken as a full year or semester course. Career guidance is also included as part of the curriculum.

ADVANCED DRAFTING: 10, 11, 12 **5 credits**

PREPARATION: Successful completion of Basic Drafting

The Advanced Drafting class is a full year course which will provide the student with a concentrated study of the advanced elements of technical drawing and design. Using AutoCAD, skills will be developed through the production of detailed drawings of machinery and assemblies. Advanced specialized areas of design such as civil, electrical and mechanical will be introduced. The study of residential and commercial Architecture will be explored with students designing a home and completing a set of typical Architectural drawings. Additional visualization and design software such as SketchUp and SolidWorks will be used to further develop the student's capabilities in 2D and 3D CAD. There will be options for the sequence of individualized studies over a three year period for the student to explore the area of their interest in the fields of Engineering, Architecture, and Construction. This course is designed for both male and female students. Career guidance is also included as part of the curriculum.

COMPUTER GRAPHICS: 9, 10, 11, 12 **2.5 credits**

This project-based course is designed for students interested in working with 2D and 3D graphics creation software used for graphic arts, 3Dmodeling, and animation. This course is intended for students interested in fields requiring design visualization such as industrial design, interior design, architectural design, engineering, animation, and game creation.

ADVANCED COMPUTER GRAPHICS: 9, 10, 11, 12 **2.5 credits**

PREPARATION: Successful completion of Computer Graphics

This project-based course is a continuation of the Computer Graphics course and is designed for students interested in fields requiring design visualization such as industrial design, interior design, architectural design, engineering, animation, and game creation.
Students will further their work with 2D and 3D design software with emphasis placed on animation and real-time interactive design.

ADVANCED APPLICATIONS IN COMPUTER GRAPHICS **5 credits**
10, 11, 12

PREPARATION: Successful completion of Advanced Computer Graphics

This project-based course will provide the student with an opportunity to develop skills with digital media while working from multi open-ended design briefs. This course is structured as an independent study course allowing a student's individual interests to bear upon the completion of comprehensive projects.

APPLIED TECHNOLOGY: 9, 10, 11, 12

The Applied Technology program is designed to introduce students, grades 9 through 12, to Math, Science and Technology problem solving, related to land, sea, air and space communication technology. It includes hands-on design activities that integrate skills from Language Arts, Mathematics, Science and Social Studies. Students can take Sequence 1, Sequence 2, or both. Course sequences below.

SEQUENCE 1
Air Technology/Space Technology **5 credits**

●**Air Technology** will deal with the design and construction of airplanes powered by energy, such as human, solar power, wind power, electric power and rubber band power. Fuel-powered radio controlled airplanes will also be studied and flown. When designing any of these airplanes the student will consider Bernoulli's principles of flight which include the structural, mechanical, electronic, control systems, human factored engineering and the environment in which the airplane operates. Students will learn how early aviation pioneers used glider models and full-sized gliders to study the principles of flight, an essential part of the design process.

●**Space Technology** will deal with the design and construction of various methods of space transportation (i.e. rockets, sky sails, wind sails, gliders) powered by energy, such as CO_2, solar, solid rocket fuel, air-compression, and the forces acting on it. Motion, friction, inertia, force, acceleration, momentum, strength, center of mass and rotational inertia. Energy and torque will be applied in the process. Human factored engineering and the environment in which the rocket operates are part of the design process.

SEQUENCE 2
Land Technology/Sea Transportation **5 credits**

●**Land Technology** will focus on motion, friction, inertia, force, acceleration, momentum, strength, center of mass and rotational inertia, energy and torque as they apply to land based vehicles. Land transportation will deal with the design and construction of vehicles powered by energy, such as the CO_2 car, mousetrap, solar power, wind power, gravity power, hydrogen fuel cell power, electric power, mobile robots, rubber band powered vehicles, and gasoline power. When designing any of these land vehicles, the student will consider human-factored engineering and the environment in which the vehicles operate.

●**Sea Transportation** will deal with the design and construction of vehicles powered by energy, such as CO_2, mousetrap, wind power, electric power, and rubber

band, and gas powered boats and submarines. Motion, friction, inertia, energy and torque will be applied in the process. When designing any of these sea vehicles, the student will consider the structural, mechanical, electronic, and structural systems while generating ideas. Human factored engineering and the environment in which the sea vehicle operates is of the utmost importance. Students should have completed either Intro to Applied Technology or Basic/Advanced Woods.

UNIQUE ELECTIVE AT EAST

SMALL ENGINES: 9, 10, 11, 12 **2.5 credits**

This half-year, 2.5-credit course will provide the student with an understanding of how small gasoline engines are used to do many different types of work. Students will experiment with CO2 powered vehicles, rocketry, robotics, magnetic levitation, electric motors, and aviation. This course is designed to help students exercise problem solving skills and critical thinking. A hands-on approach will be used to reach these goals. Safety will be emphasized and will be an integral part of each unit. This course has been designed for male and female students.

UNIQUE ELECTIVE AT WEST

SUSTAINABLE DESIGN 1: AN INTRODUCTION TO SUSTAINABILITY AND DESIGN FUNDAMENTALS: 9, 10 **5 credits**

Sustainable Design 1 is project-based, design-based course that focuses on the realm of design—requiring the thought and application of art, science and technology. An emphasis is placed on developing spatial and visualization skills, and communicating concepts through drawings and models. Descriptive geometry, orthographic drawing, and computer modeling are used to explore the interrelationships of space, structure and visual composition. Cultural and environmental sustainability and regeneration form the foundation upon which design occurs. Students investigate and integrate emerging sustainable and regenerative ("green") methods and technology. Students gain an understanding of the relationships between what we build and its impact upon the natural world and human communities. Because design is inherently trans-disciplinary this course integrates mathematics, art, natural science, social science, business, and language arts. Drawing, designing and building are balanced with research and writing—hands and mind working as one.

Students who have an interest in architecture, construction trades, industrial design, engineering, environmental science, agriculture, resource management, or who simply like to work with the hands and mind should consider taking this course.