

# Technology

All Technology Education courses may be chosen by any student as separate electives or a five-unit sequence requirement of graduation. Courses in a sequence may be taken in any order and are open to all grades.

Technology Education is an exploratory program of instruction in the resources, systems, and impacts of technology. Students enrolled in Technology Education courses study the major technological systems of the world and our society. Technology Education courses have been designed to meet the needs of all academic levels and are taught through laboratory-based, "hands-on" learning activities.

Students who choose to be Technology Majors may waive the foreign language graduation requirement with a 5 unit sequence of Technology for the Regents with Advanced Designation Diploma.

## Half Year - ½ Unit Courses:

- Architectural Design
- Architecture – Residential
- Computer Aided Design & Drawing+ (CADD)
- Construction Systems
- Creativity & Innovation (woodworking)\*
- Digital Electronics+
- Electricity/Electronics+
- Graphic (Electronic) Processes
- Manufacturing Systems\*
- Metals and Fabrication
- Photography I/Technical+
- Photography II/Applied
- Transportation Systems

\* *Wood is the primary material.*

## Full Year - 1 Unit Courses:

- Design & Drawing for Production+\*\*
- Principles of Engineering
- Web Communication
- World of Technology

\*\**Note: All students may take this course as an alternative for the Art/Music requirement.*

## Dual Enrollment College Course Option

Receive high school plus college credit for taking the following courses: This option requires a fee paid to the college at a reduced tuition cost.

- Computer Aided Design & Drawing+(CADD)
- Digital Electronics+
- Drawing for Design and Production+ (DDP)
- Electricity/Electronics+
- Photography I/Technical+

## Architectural Design

*(Offered every other year opposite Residential Architecture – odd years starting 2017)*

**Semester Course**      **½ Unit**  
**Grades 10-12**

**Prerequisite: None**

Students in Architecture Design will take on the role of a developer to layout a small community given a specific piece of land to work with. From the layout students will then design the buildings needed for the community such as restaurants, mini-marts, gas stations, town hall, school, Fire Department. Students will explore: typography/ surveying skills, basics of development layout and the elements of good design. Students will sketch design concepts and finalize plans through the use of Computer Assisted Drawings (CAD) for their projects.

## Architecture – Residential

*(Offered every other year opposite Architectural Design – even years starting 2018)*

**Semester Course**      **½ Unit**  
**Grades 10-12**

**Prerequisite: None**

Students in Residential Architecture will design a home in the style of their choice. The house design portfolio will consist of sketches, drawings and possibly a scale model. Students will explore: architectural styles, elements of good design and construction techniques. Students will use both hand drawing and Computer Assisted Drawing (CAD) in their projects.

## Computer Aided Design & Drawing + (CADD)

**Semester Course**      **½ Unit**  
**Grades 10-12**

Prerequisite: None

This is a beginning course in engineering drawing using design software. The key part of this course involves creating and manipulating 3-dimensional solids to solve technical problems and produce quality drawings. A variety of drawing practices will be covered such as: wire-frame modeling, engineering analysis, and rendering.

*Dual Enrollment - Students may elect to take this course for college credit. The college credit option DOES require a fee.*

## Construction Systems

**Semester Course**      **½ Unit**  
**Grades 9-12**

Prerequisite: None

In this course students will gain knowledge in the Construction field. This course will provide students with the proper knowledge to successfully maintain their own houses as well as provide students with the construction background to successfully continue a career in one of the construction trades. Units to be covered are Concrete, Framing, Roofing, Drywall, Plumbing, Finish Carpentry, and House Financing.

## Creativity and Innovation

**Semester Course**      **½ Unit**  
**Grades 10-12**

Prerequisite: None

The student will design and build a project of their choice. Typical projects have included items of furniture, speaker enclosures and storage units. Students will be taught how to use tools and machinery necessary to complete their projects. The student will work with the instructor to develop plans to satisfy the course requirements.

## Design and Drawing For Production+

**Full Year Course**      **1 Unit**  
**Grades 9-12**

Prerequisite: None

Students will work through the creative design process to develop solutions to various design problems. An emphasis will be placed on sketching and 3-D computer modeling as a means to accurately describe their solutions to problems. Students will learn the basics of: technical drawing, dimensioning, computer aided drawing, and model making.

*Note: All students may use this course to satisfy the required one unit of Art/Music credit for graduation.*

*Dual Enrollment - Students may have the opportunity to obtain college credit for this course. The college credit option DOES require a fee.*

## Digital Electronics+

**Semester Course**      **½ Unit**  
**Grades 9-12**

Prerequisite: Electricity/ Electronics or teacher's permission.

This course is designed for students considering careers in engineering, computer science or electronics. The digital electronics course is modeled after freshman level college electronics courses. Students in this course will learn about circuits that are found in computers, watches, CD players, video games and calculators. Students will design, test and build many digital logic circuits. Students will use computer simulation software as a design tool.

*Dual Enrollment - Students may have the opportunity to obtain college credit for this course. The college credit option DOES require a fee.*

## Electricity/Electronics+

**Semester Course**      **½ Unit**  
**Grades 9-12**

Prerequisite: None

Students will learn how electricity is generated, transmitted, controlled, and used. This "hands-on" course will involve students in many activities including: building electronic projects, making printed wiring boards, automotive wiring, residential wiring, using testing instruments and using computer simulation software.

*Dual Enrollment - Students may have the opportunity to obtain college credit for this course. The college credit option DOES require a fee.*

## Graphic (Electronic) Processes

**Semester Course**      **½ Unit**  
**Grades 9-12**

Prerequisite: None

Students will have instruction and hands-on activities in the field of printing with image design, layout for pre-press processes, image transfer (printing), electronic imaging, finishing and desktop publishing. Other computer technologies will be stressed. Careers in the graphic arts fields will be explored.

## Manufacturing Systems

**Semester Course**      **½ Unit**  
**Grades 9-12**

Prerequisite: None

In this course students will be working with a variety of machines and hand tools in order to mass produce products for consumers. Students will learn and implement techniques used in the manufacturing industry to increase production time as well as increase production quality. Students will be educated in the use of hand tools and machinery necessary to complete their manufacturing projects.

+ Dual enrollment course

## Metals and Fabrication

**Semester Course**      **½ Unit**  
**Grades 10-12**

Prerequisite: None

This introductory course teaches students about the different types and properties of metals, along with the most common methods used to fabricate metal objects. Major areas of study include: applied shop math, soldering copper pipe, sheet metal layout and fabrication, precision measurement, precision turning, machining, brazing, and MIG welding. The course includes a basic review of technical sketching and dimensioning, along with an overview of the engineering design process. Shop safety is taught and stressed throughout the course. Students will complete activities and projects related to metalworking, and will work in teams to design, model, and prototype a solution to a problem that involves metalworking.

## Photography I/Technical+

**Semester Course**      **½ Unit**  
**Grades 9-12**

Prerequisite: None

This photography course will introduce the student to the basic elements of photography which are: camera handling, film, film processing, enlarging techniques, and finishing procedures as well as digital photography. The course will begin with the basics and then help each student to develop a personal style of picture taking. A focus is on the processes involved in producing photographic prints.

*Dual Enrollment - Students may have the opportunity to obtain college credit for this course. The college credit option DOES require a fee.*

## Photography II/Applied

**Semester Course**      **½ Unit**  
**Grades 9-12**

Prerequisite: Photography I+ - or Instructor's Approval

The advanced photography course will explore in greater depth the technical aspects of photography. Items to be covered include: advanced enlarging and darkroom techniques, use of adjustable cameras (35mm cameras), lighting techniques, studio portrait photography, digital photography and career potentials in photography.

## Principles of Engineering

**Full Year Course**      **1 Unit**  
**Grades 11-12**

Corequisite or Prerequisite: Geometry & Physics R

Principles of Engineering (POE) is a course in applied physics and mathematics that helps students develop their understanding of the various fields of engineering and engineering technology. Topics of study include: the history of engineering, fields of engineering, technical writing, technical presentation and communication standards, computer-aided design (CAD), engineering design process, simple machines and mechanisms, fluid power, electrical systems and circuit analysis, automated control systems, applied engineering statistics and quality, materials and material properties, statics and kinematics.

*Note: Students may take this course as either a technology elective, a third year of mathematics OR a third year of science.*

## Transportation Systems

**Semester Course**      **½ Unit**  
**Grades 9-12**

Prerequisite: None

Students will learn how land, aviation, aerospace and marine transportation systems operate. Students will design and build model rockets, airplanes and boats. Students will learn how to properly maintain vehicles.

## Web Communications

**Full Year Course**      **1 Unit**  
**Grades 9-12**

Prerequisite: None

Students will learn how to design their own web pages and build websites using HTML coding and web editing software. Utilizing Adobe Dreamweaver, students will design complex web pages that are colorful, informative and interactive. Students will gain experience using FTP to upload their web pages to the Internet.

## World of Technology

**Full Year Course**      **1 Unit**  
**Grades 11-12**

Prerequisite: Successful completion of both Geometry and 1 unit of Regents Science.

World of Technology is a course in pre-engineering, and problem solving. Units in structural engineering, electrical/mechanical engineering, auto safety engineering, power tools, and engineering materials. This is a full year course. Students will enter the northeast high school STEM Competitions hosted at MCC in the spring. This course counts as a third unit in math or science. Students compete in 3 real world modeling competitions during the final months of the course. Students must be in 11th or 12th grade.

*Note: Students may take this course as either a technology elective, a third year of mathematics OR a third year of science.*

+ Dual enrollment course

# High School Technology Department

## 5-Unit Sequence Requirements

Required	Careers and Financial Management+		
<b>Systems Courses</b>			
Select 2	Manufacturing Systems	Transportation Systems	Construction Systems
<b>Foundation Courses</b>			
Select 2 *	Electricity/ Electronics+	DDP+ – 1 unit	Graphic (Electronic) Processes

*\*Extra foundation course may be used as elective credit.*

<b>Balance of 5 Units Chosen From This List</b>		
Residential Architecture	Photography I/ Technical+	Photography II/Applied
Creativity & Innovation	Web Communications – 1 unit	Metals and Fabrication
Principles of Engineering – 1 unit	World of Technology – 1 unit	Computer Aided Design & Drawing+
Architectural Design	Digital Electronics+	

<b>Suggested Sequence</b>	
<b>Grade 9</b>	Design & Drawing for Production+ (DDP) 1 unit /System Courses
<b>Grade 10</b>	System/Foundation Courses
<b>Grade 11 and 12</b>	Careers and Financial Management+
	System/Foundation Courses
	Remaining Elective Units

+ Dual enrollment course