Technology Education

- Academy of Engineering
- Film and Multimedia Concentration (East)

… the bridge between problems and solutions through the application of knowledge

The skills, interests and ability levels of our students are diverse. The avenue that each student will travel to reach their occupational or career goals is also diverse. New York State has mandated 28 Learning Standards that students must meet. Technology Education offers each student the opportunity to enhance their chances to meet these standards.

Educators, parents and students realize that the skills necessary to become a productive member of our information - based society have changed. A student who emerges from our educational system must be flexible enough to keep pace with ever changing technology. Many of the jobs these students may end up in have not even been invented yet. The various course offerings in Technology Education bridge the gap between the needs of students today and the rapidly changing employment demands of tomorrow. All of these courses allow students to develop critical thinking and problem solving skills. We ask our students to write, read, do mathematical functions, use scientific principles and understand social and historical concerns as they relate to cutting edge real life activities. We provide the challenge that encourages students to become lifelong learners.

Each of these offerings allows the student the opportunity to explore occupational choices, and provide the skills, attitudes and knowledge that will allow them to succeed in the workplace.

COURSE OFFERINGS

Course	Credit	Length	Type of Exam
Design & Drawing for Production	1 unit	40 weeks	Local
Construction Systems	1 unit	40 weeks	Local
Woodworking I	½ unit	20 weeks	Local
Woodworking II	½ unit	20 weeks	Local
Film and Multimedia Prod (East)	1 unit	40 weeks	Local
Computer Aided Design (CAD) (East)	½ unit	20 weeks	Local
Computer Aided Design II (CAD II) (East)	½ unit	20 weeks	Local
Principles of Engineering (East)	1 unit	40 weeks	Local
Television Production (West)	1 unit	40 weeks	Local
Transportation Systems (West)	½ unit	20 Weeks	Local
Digital Electronics (West)	½ unit	20 Weeks	Local
Media Productions (West)	1 unit	40 weeks	Local

*Hilbert College: Students who successfully complete TV Productions and Media will earn 6 credit hours if they attend Hilbert College

Design and Drawing for Production (DDP)
Credit: 1 Unit Length: 40 Weeks
*Satisfies the Art / Music requirement
DDP provides you with opportunities to be creative and to apply your decision - making and problem solving skills to design problems. You'll use powerful computer hardware and software to develop 3D models or solid renderings of objects. Using a Computer Aided Design System, you will learn the product design process through creating, analyzing, rendering and producing a model. This course is an introduction to the universal language of technical drawing. Through the mastering of this language, utilizing the computer students will be able to express technical ideas with speed, clarity, and exactness. DDP is a vehicle for world-wide industrial communications and an integral step in the process of designing and producing goods. Students will develop spatial visualization by solving practical design problems. The ideas become working drawings and students are encouraged to make scale models of their solution. Thereby the process of sketching ideas, drawing details of all parts, and the actual production of the product completes the design cycle.

Construction Systems
Credit: 1 Unit Length: 40 Weeks
Students will investigate the organization of a construction project. They will review the inputs, processes, and outputs of a construction project either on an individual basis, in a small group setting or as a class. The projects will take the form of bridges, high-rise buildings, geodesic domes, and other school related possibilities. Students will also investigate the materials, procedures, economics, and systems used in the construction of residential dwellings. Topics will include related careers, finances, supplies, tools, equipment, techniques and safety considerations. Enrichment through visitations to residential projects at various stages will take place. This will be accomplished through a series of laboratory activities, lessons, and discussions. Students will be encouraged to identify and solve problems with a 75% activity and 25% lesson/demonstration format.

Media Productions (West)
Credit: 1 Unit Length: 40 Weeks
Students who participate in this course will understand how various video production components such as audio and visual equipment will be used to apply media to a message. They will learn how to produce a message with electronic pre-production, production, and post-production equipment. This course emphasizes hands-on activities as each student learns how to run all the video equipment in our state of the art studio.
Some activities might include: Developing a critical eye to video • Preparing a storyboard and script • Using a video camera to capture images • Editing, and adding the sound and titles to the video • Working in the video studio. Serves as a prerequisite to TV Productions.

Television Production (West)
Credit: 1 Unit Length: 40 Weeks
Prerequisite: Media Productions or T.V. Broadcasting
This course builds on the knowledge gained in the media productions class. A more detailed approach will be given to the methods of television production. Students will direct and produce the daily live school newscast. Internships in local media outlets will be made available to those students who are interested and qualified. They will have

the opportunity to work with people in the school and from the public as clients to produce short segments for public viewing. Students will be encouraged to enter their work for public display and competition. Some activities will require extracurricular time, however it is not mandatory
Note: Cannot be taken simultaneously with T.V. Broadcasting.

Principles of Engineering (POE) (East)
Credit: 1 Unit Length: 40 Weeks
*Satisfies 3rd credit of Math
Principles of Engineering is a course developed around the State standards for Math, Science, and Technology. Using a hands-on approach, students are posed open-ended engineering problems that cover a wide range of content. Major concepts are introduced at the beginning of the course and reinforced through the design studies. The course is a Math integrative, hands-on laboratory setting that is appropriate for students interested in engineering and/or looking to fulfill their 3rd credit of Math. Design problems include: design of a marble sorter using Fischertechniks, building and testing a ballistic device, and design and construction of a bridge.

Woodworking I
Credit: 1/2 Unit Length: 20 Weeks
Woodworking I introduces students to the various kinds of woods used in industry and offers experience in using selected woodworking tools such as scroll saw, band saw, power sander and the drill press. Students learn to design and construct projects which start at a beginner level and become more challenging as students advance. Correct and safe use of tools and equipment is emphasized. Students will build projects that they are able to take home. This course is appropriate for 10th, 11th and 12th grade students.

Woodworking II
Credit: 1/2 Unit Length: 20 Weeks
Prerequisite: Woodworking I
This hands-on intermediate woodworking course is a continuation of Woodworking I with a strong emphasis on safety, accuracy, craftsmanship in the finished product. In addition to the machines learned in Woodworking I, students will learn to safely use the table saw, surface planer, joiner and router. Students will learn the mass-production process and how to prepare a bill of materials. As students advance, they focus on learning the terminology necessary to use power tools successfully, developing skills to safely use these tools in the workshop and becoming familiar with various kinds of wood-finishing. Students will produce projects that they can take home.

Transportation Systems (West)
Credit: ½ Unit Length: 20 Weeks
The development of transportation systems throughout the world has a tremendous impact on the intellectual and economic growth of societies. Transportation systems allow people to move not only themselves, but also durable and nondurable goods in increasingly fast and efficient ways. This curriculum explores transportation systems for three perspectives: Land transportation, marine transportation, and aerospace transportation.

Computer Aided Design (CAD) (East)
Credit: 1/2 Unit Length: 20 Weeks
Prerequisite: Design Draw Production (DDP)
This course builds on the knowledge gained in DDP class. This hands-on intermediate computer design course is a continuation of

DDP with a strong emphasis on computer modeling, joinery, assembly, tolerances, parametric constraints, and prototyping using 3D printer and CNC technologies. Students will further develop their skills by developing advanced design models and fabricating complex projects. This course is appropriate for 10th, 11th, and 12th grade students.

Computer Aided Design II (CAD II) (East)
Credit: 1/2 Unit Length: 20 Weeks
Prerequisite: CAD
This course builds on the knowledge gained in both DDP and CAD courses. CAD II has a strong emphasis on advanced computer modeling which utilizes inventor software. Topics include sheet metal design, i-parts parametric constraints, material testing and prototyping. Students will design advanced products and organize all of the production needs from materials needed to processing tools and machines. Students will use a variety of fabricating processes to prototype their projects including CNC and 3D printing technologies.

Digital Electronics (West)
Credit: ½ Unit Length: 20 Weeks
Digital Electronics is a course in applied logistics. You will be introduced to the digital circuits found in video games, watches, calculators, digital cameras, and thousands of other devices. You will study the application of digital logic and how digital devices are used to control automated equipment. Students will learn about electronic components and circuits through the use of breadboards and soldering printed circuit boards. The concepts of conductors, insulating materials, resistance, voltage, current, Ohm's Law, energy, work and power, measuring instruments and techniques.

Film and Multimedia Production (East)
Credit: 1 Unit Length: 40 Weeks
Prerequisite: Seniors Only
Students will be introduced to the technological aspects of film and multimedia production. Emphasis will be on the software, equipment and techniques that would be found in a small production company. They will learn introductory and intermediate editing techniques using Adobe Premiere Pro. Students will use a variety of digital video recording equipment and lighting equipment. Students will be required to incorporate thoughtful use of titling and text, transitions, effects, narration and musical accompaniment. Emphasis will be placed on using technology as an effective storytelling tool. This course is required as part of the Film and Multimedia Concentration and will culminate in a film festival highlighting the students' work.

Academy of Engineering

Students have an opportunity to join this "school within a school" program beginning in their sophomore year. Students enrolled in the Academy will receive a Regents diploma or Regents Diploma with an advanced designation along with an expanded certificate in the Academy of Engineering.

Students will achieve universal engineering skills and knowledge with a focus on the production or civil engineering field. Students will participate in a vast array of industry-sponsored activities including field trips, shadow days, classroom speakers, the pre-engineering fair, and internships.

Academy Course Sequence

• Four Year Program •

Grade Level	Course	Credit
Ninth Grade - Recruitment, application, and selection of students	Design Drawing for Production	1 unit
Tenth Grade	Materials I and II	1 unit
Eleventh Grade	Engineering and Robotics	1 unit
	Civil Engineering and Architecture	1 unit
Twelfth Grade	Engineering Development and Design	1 unit

Graduation - Certificate of Studies in Engineering in addition to Regents Diploma or Regents Diploma with an Advanced Designation

Design and Drawing for Production (DDP)

Credit: 1 Unit Length: 40 Weeks

*Satisfies the Art / Music requirement

DDP provides you with opportunities to be creative and to apply your decision - making and problem solving skills to design problems. You'll use powerful computer hardware and software to develop 3D models or solid renderings of objects. Using a Computer Aided Design System, you will learn the product design process through creating, analyzing, rendering and producing a model. This course is an introduction to the universal language of technical drawing. Through the mastering of this language, utilizing the computer students will be able to express technical ideas with speed, clarity, and exactness. DDP is a vehicle for world-wide industrial communications and an integral step in the process of designing and producing goods. Students will develop spatial visualization by solving practical design problems. The ideas become working drawings and students are encouraged to make scale models of their solution. Thereby the process of sketching ideas, drawing details of all parts, and the actual production of the product completes the design cycle.

Materials Processing I

Credit: 1/2 Unit Length: 20 Weeks

Through hands-on activities, demonstrations and assessments, the students will gain knowledge, skills and abilities that will enable them to construct small projects. Students build projects that they are able to bring home. Students will be given instruction in the safe operation of

woodworking machine tools, such as the table saw, surface planer, joiner, scroll saw, band saw, power sander, lathe and drill press. Students will also learn machine set-up with an emphasis on safety. This course is appropriate for 10th, 11th and 12th grade students.

Materials Processing II
Credit: 1/2 Unit Length: 20 Weeks
Prerequisite: Materials Processing I
This hands-on intermediate woodworking course is a continuation of Material Processing I with a strong emphasis on safety, accuracy, craftsmanship in the finished product. Students will build upon the knowledge previously acquired to develop processes for design and fabrication of more complex projects. This class emphasizes teamwork, creativity and craftsmanship. Students may have to provide their own materials for their final project.

Civil Engineering & Architecture
Credit: 1 Unit Length: 40 Weeks
This course provides an overview of the fields of Civil Engineering & Architecture, while emphasizing the interrelationship and dependence of both fields on each other. Students use state of the art software to solve real world problems and communicate solutions to hands-on projects and activities. This course covers roles of civil engineers and architects, project planning, site planning, building design and project documentation and presentation.

Engineering and Robotics
Credit: 1 Unit Length: 40 Week
Engineering and Robotics is a high school-level survey course of engineering. The course exposes students to some of the major concepts that they will encounter in a postsecondary engineering course of study. Students have an opportunity to investigate engineering and high tech careers. Engineering and Robotics gives students the opportunity to develop skills and understanding of course concepts through activity, project, and problem-based (APPB) learning. Used in combination with a teaming approach, APPB learning challenges students to continually hone their interpersonal skills, creative abilities, and problem solving skills based upon engineering concepts. It also allows students to develop strategies to enable and direct their own learning, which is the ultimate goal of education. To be successful in Engineering and Robotics, students should be concurrently enrolled in college preparatory mathematics and science. Students will employ engineering and scientific concepts in the solution of engineering design problems. Students will develop problem-solving skills and apply their knowledge of research and design to create solutions to various challenges.

Engineering Design and Development (EDD)
Credit: 1 Unit Length: 40 Week
In this course you will work as part of a team to design a solution to an engineering problem. The problems will involve a wide range of engineering applications (e.g., school robot-mascot, automated solar water heater, remote control hovercraft, to name a few ideas. You will apply the principles you developed in the previous courses. Each team will be responsible for delivering progress reports and making final presentations to an outside review panel. The completed portfolio will be invaluable when you begin applying to colleges.

Film and Multimedia Concentration (East)

The Film and Multimedia Concentration is a senior level set of courses which will prepare students to enter college programs and career fields that require a broad range of experiences in the areas of film and multimedia production including experience with public speaking, communications, journalism and video production. The program emphasizes a multidisciplinary, team approach to creative endeavors and reproduces the environment of a small production company.

The concentration consists of two courses: Film and Multimedia Production (technology), and Creating Narrative Cinema (English - Counts as Senior year of English). The program will culminate in a student produced film-fest at the end of the year. Hosted in the Auditorium by students, the East Senior Film Fest will be open to parents, relatives and students.

Concentration Courses

• Senior Year Program •

Course	Department	Credit
Film and Multimedia Production	Technology	1 unit
Creating Narrative Cinema	English	1 unit

*Must take both courses

Film and Multimedia Production

Credit: 1 Unit Length: 40 Weeks
Prerequisite: Seniors Only and required for concentration

Students will be introduced to the technological aspects of film and multimedia production. Emphasis will be on the software, equipment and techniques that would be found in a small production company. They will learn introductory and intermediate editing techniques using Adobe Premier Pro. Students will use a variety of digital video recording equipment and lighting equipment. Students will be required to incorporate thoughtful use of titling and text, transitions, effects, narration and musical accompaniment. Emphasis will be placed on using technology as an effective storytelling tool. This course is required as part of the Film and Multimedia Concentration and will culminate in a film festival highlighting the students' work.

Creating Narrative Cinema

Credit: 1 Unit Length: 40 weeks
Prerequisite: Grade 12 and enrolled in Film and Multimedia Production, satisfies 4th unit of English

This course will focus on the creation of narrative cinema using basic narrative principles of English Language Arts (character, conflict, dialogue, point of view, and plot but with a screenwriting focus) in addition to incorporating film analysis to gain further insight into the visual, literary, aural, and performance aesthetics that comprise a work of cinema. By the end of the course, students will have acquired the knowledge and skills of reading film,

developing personal meanings and interpretations of film, and written/visual cinematic composition as it pertains to film production (creative writing, script writing, storyboarding, brainstorming, literary adaptation, etc.). Students will produce various scripts tackling a wide range of formats: public service announcements (PSAs), commercials, comic and dramatic sketches and skits, a short documentary film and a short narrative film. This course is offered as part of the Film and Multimedia Senior Concentration and will culminate in a film festival highlighting student work. This course will satisfy the 4th unit of English.