Chautauqua Lake STEAMM Works

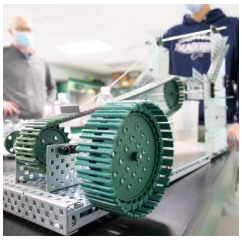
Science, Technology, Engineering, Arts, Math & Manufacturing For Visiting Scholars

Where technology sparks creativity & creativity sparks a career.

Mrs. Rachel Curtin, Principal
Dr. Josh Liddell, Superintendent
Mr. Mike Ludwig, President, Board of Education
Mr. Travis Bensink, Vice President, Board of Education

Mr. Dan McCray, Manufacturing/STEMM Teacher
Mr. Nick Raynor, Intro to Engineering
Mr. Alex Reyda, Principles of Engineering
Mr. Jim Tennies, Civil Engineering & Architectural Drawing
Mr. Adam Gollwitzer, Environmental Sustainability
Mr. Bill Persons, Digital Electronics
Mr. Jay Baker, CEO Jamestown Plastics
Mr. Randy Stuart, CEO STUART Tool & Die

Chautauqua Lake STEAMM W⊛rks for Courses



Engineering with Project Lead the Way
18 credits

Introduction to Engineering (3 credits)

Digital Electronics (3 credits)

Principles of Engineering (POE) (3 credits)

Civil Engineering and Architecture (CEA) (3 credits)

Computer Integrated Manufacturing (CIM) (3 credits)

Environmental Sustainability(3 credits)

Design, Drawing for Production Manufacturing
12 credits

Design & Drawing for Production Manufacturing (DDPM1)
JCC Welding WLD 1200 (3 credits)

Design & Drawing for Production Manufacturing (DDPM 2)
JCC Welding WLD 1350 & 1360 (6 credits)

Advanced Design & Drawing Computer Integrated Manufacturing (DDPM 3)
JCC Manufacturing MCT 1270 (3 credits)

Honors Design & Drawing for Production Manufacturing (DDPMH 4)

Language and Arts
3 credits

Woodworking Arts

Theatrical Set Design

Technical English Language Arts & JCC English 1510 (3 credits)

New York State Advanced Regents and Regents Diploma pathway through STEAMM Works

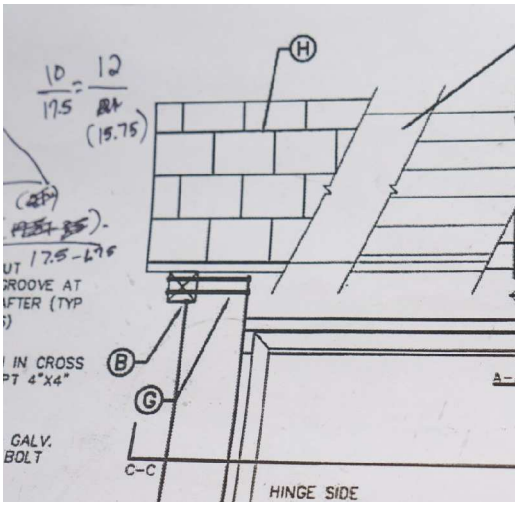
Students in the STEAMM pathway at CLCS enroll in project-based learning electives that create a pathway to either a New York State Advanced Regents or Regents diploma.

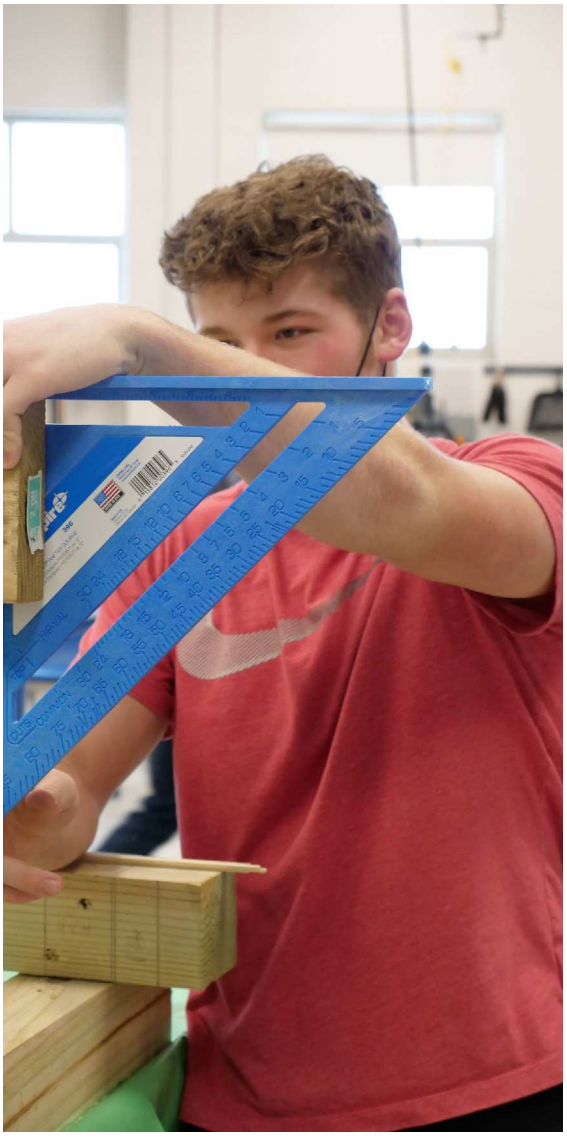
Our Technical English Language Arts and JCC English 1510 courses also provide the required English credit for 12th grade.

Most of our STEAMM pathway courses allow students to earn college credits in Science, Technology, Engineering, and Manufacturing. There are more than 60 potential college credits available to students within the CLCS course catalog, and 33 college credits specifically within this project based learning pathway.

Project-Based Learning in STEAMM Works

We are thrilled to offer students cutting-edge technology and training in our manufacturing complex. Project-based learning is a key component of our STEM complex and STEAMM curriculum. Our students work on real-world projects within our Science, Technology, Engineering, Arts, Math and Manufacturing courses. These courses teach them how to not only read blueprints and schematics to create projects, but also to become a product designer. Our welding program enables students to safely weld and shape metal with a variety of essential skills. Our state-of-the-art woodworking shop features an impressive dust collection and ventilation system, a wide selection of stationary power tools, such as table saws, band saws, planers, and shapers, and beautiful shop tables with clamps to hold workpieces while cutting and shaping their projects.





How is CLCS STEAMM Works different from other models?

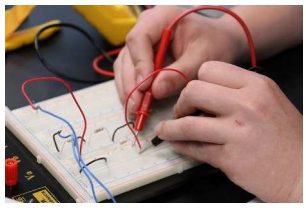
“Over the last ten years Chautauqua Lake has put in a tremendous amount of effort and resources to develop a STEAMM program that provides students the opportunity to successfully transition directly into the workforce, to college or a technical school. The goal has always been to be able to provide this amazing program not only to Chautauqua Lake students but for students throughout the county. We are fortunate to have had students from Fredonia, Brocton, and Maple Grove take advantage of this exceptional opportunity.

The development of our STEAMM program required multiple partnerships and collaborations. We are thankful for the support we have received from the Gene Haas Foundation, CPL Architectural Firm, Erie 2 BOCES, Chautauqua County Partnership for Economic Growth, the Community Foundation, Dream It Do It of WNY and numerous local manufacturing companies. In addition, we would have never been able to complete this project without the vision, support and guidance from Jay Baker and Randy Stuart. Their combined efforts and passion for manufacturing was the driving force to ensure the Baker Stuart Manufacturing Complex became a reality.”

---Superintendent Joshua Liddell

Navigating Chautauqua Lake STEAMM Works Courses Freshman & Sophomores

Chautauqua Lake STEAMM works courses are part of our traditional school Regents and Advanced Regents Pathway to a diploma and college credits. We have half-day and full-day options available for visiting scholars from other districts. Our guidance counselors will meet with each student to set a course sequence that looks at their transcripts and puts them in a position to succeed beyond high school. See below for example course sequences.





Sophomore Half-Day Honors Course Sequence earn 17 college credits

DDPM1 JCC 3 credits	Honors ELA JCC 3 credits
Algebra 2/Trigonometry PreCalculus JCC 8 credits	Intro to Engineering PLTW 3 credits

Sophomore Half-Day Traditional Course Sequence earn 6 college credits

DDPM1 JCC 3 credits	Algebra
English Composition	Intro to Engineering PLTW 3 credits

Sophomore Full-Day Honors Course Sequence Sample earn 26 College Credits

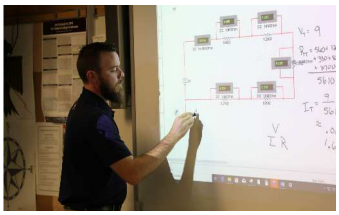
DDPM1 JCC 3 credits	Honors ELA JCC 3 credits	Global Studies II	AP Computer Science 3 AP college credits
Algebra 2/Trigonometry PreCalculus JCC 8 credits	Intro to Engineering PLTW 3 credits	Chemistry Honors JCC 6 credits	Chem Lab / Phys Ed

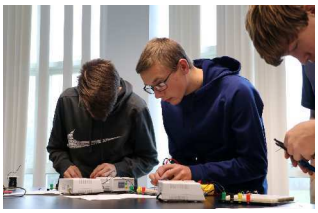
Sophomore Full-Day Traditional Course Sequence Sample earn 3 College credits

DDPM1 JCC 3 credits	Geometry	Global Studies II	Career and Financial Management
Woodworking Arts	ELA	Field Science	Geo Lab / Phys Ed

Navigating Chautauqua Lake STEAMM Works for Juniors and Seniors

Our program for juniors and seniors features a course in Technical English Literacy that includes JCC English 1510. JCC ENG 1510 is a common prerequisite for Associates Degrees and Certificates. Having this course on the transcript at graduation helps to support student success after graduation.





Senior Half-Day Honors Course Sequence Sample: 17 college credits

Technical ELA & JCC ENG 1510 3 credits	Digital Electronics PLTW 3 credits
Calculus 1 & 2 JCC 8 credits	Intro to Engineering PLTW 3 credits

Senior Half-Day Traditional Course Sequence Sample: 9 college credits

Technical ELA & JCC ENG 1510 3 credits	Field Science
DDPM 2/3 JCC 6 credits	Woodworking Arts

Senior Full-Day Honors Course Sequence Sample: 26 college credits

DDPM 4 CIM PLTW 3 credits	Technical ELA & JCC ENG 1510 3 credits	Government & Economics	Civil Engineering & Architecture PLTW 3 credits
Calculus 1 & 2 JCC 8 credits	Principles of Engineering PLTW 3 credits	Physics	Physics Lab / Phys Ed

Senior Full-Day Traditional Course Sequence Sample: 12 college credits

DDPM 2/3 JCC 6 credits	Leadership Seminar JCC 3 credits	Government & Economics	Career and Financial Management
Woodworking Arts	Technical ELA & JCC ENG 1510 3 credits	Media Productions	STEAMM lab / Phys Ed

What is the Chautauqua Lake STEAMM Works Program?

The Chautauqua Lake STEAMM Works Program features a selection of science, technology, engineering, arts, math, and manufacturing courses taught by expert teachers with a passion for student success. Courses may be taken as a single elective, combined into concentrations, or taken as a sequence. Most of the courses are also dual-enrollment (meaning students earn high school as well as college credits)

Project-based learning is a key component of our STEAMM curriculum. Our students are working on real-world projects that teach them how to not only read blueprints and schematics to create projects but also how to use an engineering approach to problem solve in the real world.

Manufacturing Skills

Our welding program enables students to safely weld and shape metal with a variety of essential skills.

Our state-of-the-art woodworking shop features an impressive dust collection and ventilation system, a wide selection of stationary power tools, such as table saws, band saws, planers, and shapers, and beautiful shop tables with clamps to hold workpieces while cutting and shaping their projects.

Robotics

Chautauqua Lake's Engineering & Technology program incorporates advanced VEX V5 PRO robotic equipment to engage students in a wide array of learning opportunities from algorithmic coding to advanced sensor integration.

Students begin by using virtual reality technologies to learn block based coding which transitions to physical robotic platforms where they can see their pseudocode program come to life! Middle and high school students test the capabilities of their designs & programming skills at local STEM events where they can compete in robotic competitions.

Our courses explore manufacturing history, individual processes, systems, and careers. In addition to technical concepts, the course incorporates finance, ethics, and engineering design which reflects an integrated approach that leading manufacturers have adopted to improve safety, quality, and efficiency.

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The DDPM course sequence includes instruction in computer-aided design (CAD) and computer-aided manufacturing (CAM) software, as well as how to use state-of-the-art tools such as the CNC lathe to bring their engineering designs from a coding project to a tool or product that they can hold in their hands.

When you think about manufacturing, it's important to remember the creative process and individual skill that brings projects and a team together. These projects challenge students to design and build products, work as a team to solve a problem that helps our community, and spark ideas that can serve as foundations for their small businesses someday.

"While attending CLCS, I was able to take advantage of every Project Lead the Way class offered as well as several more in the machine shop. With so many varied experiences and opportunities available to me, I was able to transition into my college program very easily. Taking advantage of the comprehensive programs offered at our high school, helped solidify my choice of major - computer engineering. I know that I have gained a solid foundation of skills that have continued to serve me well in college."
Joshua Janicki, class of 2018

"The courses at Chautauqua Lake are continually striving to exemplify 21st century manufacturing while preparing students for an exciting future and a fulfilling career. Our cutting edge technology equips students with the skills to be successful and prepared for a high demand career in STEM and Manufacturing fields."
-Dan McCray, Manufacturing/STEMM Teacher

Current Machines & Equipment

- Haas VF3 Vertical Machining Center
- Haas ST-15 Turning Center
- Haas Virtual Controllers (2)
- Lincoln Precision TIG 225 TIG Welders
- Miller Dynasty 210 TIG Welders (2)
- Miller 252 MIG Welders (4)
- Bridgeport Vertical Knee Mills (3)
- Clausing-Colchester Manual Lathes (3)
- K.O. Lee Surface Grinder
- Rethink Robotics Industrial Robot
- Affinia H800 3-D Printers
- Koike IK12 Max 3 Portable Cutting & Welding Machine
- Lincoln Tomahawk 625 Plasma Cutting Machine
- Ellis 1800 Mitre Cut-Off Saw
- Wilton Drill Press
- Harris Oxy-Acetylene Torches

Project Lead the Way is an academically rigorous collaboration between Chautauqua Lake and the Rochester Institute of Technology, is designed for students interested in pursuing engineering, manufacturing, or a related field in college. The program operates at Chautauqua Lake High School and is integrated with Project Lead The Way curriculum, a nationwide program that empowers students to develop in-demand skills to pursue rewarding careers.

Introduction to Engineering

IED (DDP) is an introductory course, which develops student problem-solving skills, with emphasis placed on the development of three-dimensional solid models. Students will work from sketching simple geometric shapes to applying a solid modeling computer software package. They will learn a problem-solving design process and how it is used in industry to manufacture a product. The Computer Aided Design System (CAD) will also be used to analyze and evaluate the product design. The techniques learned and equipment used is state of the art and are currently being used by engineers throughout the United States. (RIT 3 college credits)

Digital Electronics

Digital Electronics is a course of study in applied digital logic. Students will be introduced to digital circuits found in video games, watches, calculators, digital cameras, and thousands of other devices. Students will study the application of digital logic and how digital devices are used to control automated equipment. The use of digital circuitry is present in virtually all aspects of our lives and its use is increasing rapidly. This course is similar to a first semester college course and is an important course of study for a student exploring a career in engineering or engineering technology. (RIT 3 college credits)

Principles of Engineering (POE)

POE is a broad-based survey course designed to help students understand the field of engineering and engineering technology and its career possibilities. Students will develop engineering problem-solving skills that are involved in post-secondary education programs and engineering careers. They will explore various engineering systems and manufacturing processes. (RIT 3 college credits)

Civil Engineering and Architecture (CEA)

The major focus of the CEA course is a long-term project that involves the development of a local property site. As students learn about various aspects of civil engineering and architecture, they apply what they learn to the design and development of this property as a simulation or to students to model the real-world experiences that civil engineers and architects experience when developing property. (RIT 3 college credits)

The CEA course is intended to serve as a specialization course within the Project Lead The Way sequence. The course is structured to enable all students to have a variety of experiences that will provide an overview of both fields. In addition, students use Rivet, which is a state-of-the-art 3-D design software package from AutoDesk, to help them design solutions to solve their major course project. Students learn about documenting their projects, solving problems, and communicating their solutions to their peers and members of the professional community of civil engineering and architecture.

Environmental Sustainability

Environmental Sustainability (ES) is a high school-level specialization course in PLTW Engineering. In ES, students investigate and design solutions to solve real-world challenges related to clean drinking water, a stable food supply, and renewable energy. Students are introduced to environmental issues and use the engineering design process to research and design potential solutions. Utilizing the activity-, project-, problem-based (APB) teaching and learning pedagogy, students transition from completing structured activities to solving open-ended projects and problems that require them to develop planning, documentation, communication, and other professional skills. (RIT 3 college credits)

Design, Production & Manufacturing

Design & Drawing for Production and Manufacturing (DDPM 1)

This course introduces oxy-fuel and plasma-arc cutting systems. Topics include an intensive introduction to welding safety, proper equipment setup, and operation of oxy-fuel and plasma-arc cutting equipment with emphasis on straight line, curve, and bevel cutting. Upon completion, students should be able to oxy-fuel and plasma-arc cut metals of varying thicknesses as well as have an appropriate understanding of welding safety. Equivalent to JCC welding technology course WLD 1200. (3 college credits)

Advanced Design and Manufacturing (DDPM2)

Shielded Metal Arc Welding & Gas Metal Arc Welding
This course introduces the shielded metal arc (stick) welding process. Emphasis is placed on padding, fillet, and groove welds in various positions with SMAW electrodes. Upon completion, students should be able to perform SMAW fillet and groove welds on carbon plate with prescribed electrodes.

This course also introduces gas metal arc (GMAW) welding and flux core arc welding processes (FCAW). Topics include equipment setup and fillet and groove welds with emphasis on application of GMAW and FCAW electrodes on carbon steel plate. Upon completion, students should be able to perform fillet welds on carbon steel in the flat, horizontal, and overhead positions.
Equivalent to JCC welding technology course WLD 1350. (3 college credits) & WLD 1360. (3 college credits), 6 credits total

Design, Production & Manufacturing

Advanced Design and Drawing/Computer Integrated Manufacturing (DDPM3)

In this course, students will develop skills and theoretical knowledge of three-dimensional computer aided design and modeling tools, and computer numerically controlled machine technologies. Students will learn about virtual design, computer assisted fabrication, flexible manufacturing systems, and contemporary CNC machining technologies. The skills and knowledge developed during completion of predetermined projects will be used to design, program, and build a self-directed final project. Equivalent to JCCMCT 1270 (3 college credits)

Honors Design & Drawing for Production & Manufacturing Capstone (DDPMH4)

Students work with advisement and guidance to integrate their knowledge of design, production, and Computer Integrated Manufacturing into a Service Learning capstone project. Students research a community or field-related need and design, produce and manufacture a capstone project to fit these needs.

"The experiences I've taken away from this machine shop have been absolutely incredible. It really teaches you a lot of different ways on how to be a machinist, and it really shows you a good work environment. There is not just one thing that you get to learn. You can explore a specific field that you take an interest in such as welding or machining or using a CNC. It has been an overall wonderful experience."
- Jeff Bajdo, Class of 2022

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For more information or to schedule a tour, please contact

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