Mechanics Institute

An Educational Program of

The General Society of Mechanics & Tradesmen

2025 Course Catalog

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OFFICERS OF
THE GENERAL SOCIETY OF MECHANICS & TRADESMEN

THE MECHANICS INSTITUTE WAS FOUNDED IN 1858 BY
THE GENERAL SOCIETY OF MECHANICS & TRADESMEN OF THE CITY OF NEW YORK.

THE OFFICERS OF THE GENERAL SOCIETY FOR THE YEAR 2025 ARE:

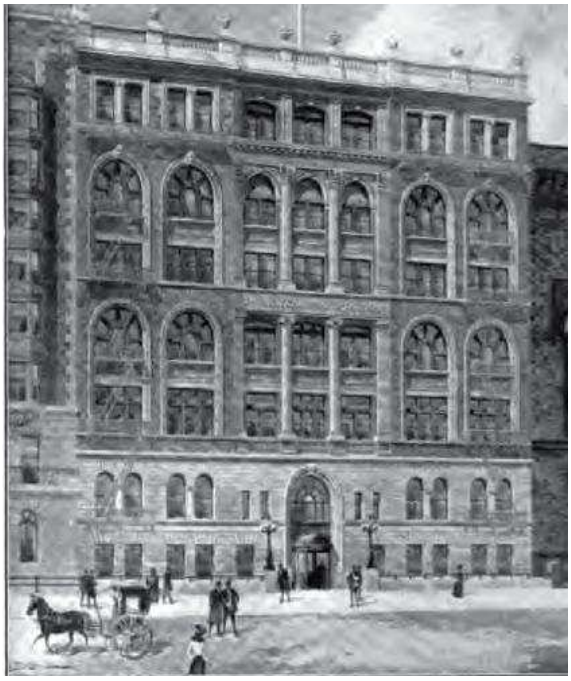
Frank Gibbons, *President*
Brian McAuliffe, *Vice President*
Terrance C. Holliday, *Secretary*
Gerald Caporicci, *Treasurer*

MECHANICS INSTITUTE'S SCHOOL COMMITTEE IS COMPRISED OF ONE CHAIRPERSON AND MEMBERS OF THE GENERAL SOCIETY OF MECHANICS & TRADESMEN. THE SCHOOL COMMITTEE MEETS REGUARLY TO REVIEW SCHOOL OPERATIONS, FORMULATE POLICY, DETERMINE BUDGETS, AND PROVIDE DIRECTION.

Frank Gibbons, Mechanics Institute School Chair
Victoria A. Dengel, P.P., Executive Director

MECHANICS INSTITUTE

Among the many resplendent flags unfurling in the midtown Manhattan breeze is the gold and royal blue emblem of the General Society of Mechanics & Tradesmen (GSMT). Beneath that flag, which flies above 20 West 44th Street, is the entrance to the stately landmark building that it has occupied for over a century. Housed within the oak and marble walls, beneath the subdued glow of polished antique lamps, is New York City's oldest technical program, the **Mechanics Institute**.



A Proud Tradition of Instructing Working Adults

The **General Society of Mechanics & Tradesmen of the City of New York** was founded on November 17, 1785, by twenty-two skilled tradesmen who gathered in Walter Heyer's house on Pine Street in lower Manhattan. The aims of the General Society were to provide cultural, educational, and social services to families of skilled craftsmen. During this early period, The General Society celebrated the mutuality and centrality of the craft community. Apart from its charitable activities, the Society played a prominent role in the festivities that marked patriotic holidays, carrying banners emblazoned with *"By Hammer and Hand all Arts do Stand."*

In 1820, The General Society opened one of the City's first schools that was free to members. There was no public school system in New York at the time. Our school opened with seventy students. Children of members were admitted free of charge, and a small fee was required from all others. Later that same year the Society added a separate school for girls.

In 1858, after the New York City public school system had been sufficiently developed and daytime instruction became widely available, The General Society elected to convert its school into a Mechanics Institute that would provide training to those citizens whose work obligations prevented their pursuit of a formal technical education. The Mechanics Institute to this day continues to provide tuition-free evening instruction in trades-related education.

Historically, Mechanics Institutes were educational establishments formed to provide adult education, particularly in technical subjects, to working men and, later, women. As such, they were often funded by local industrialists on the grounds that they would ultimately benefit from having more knowledgeable and skilled employees. The Mechanics Institute also provided library access for the adult working class.

The first Mechanics Institute was founded as The Edinburgh School of Arts (now Heriot-Watt University) in October 1821, through the initiative of Leonard Horner, with the second Mechanics Institute formally incorporated at Glasgow in November 1823. Both were inspired by work begun at the turn of the previous century by George Birkbeck. Through the auspices of the Andersonian University, Birkbeck first offered free lectures in Glasgow on arts, science, and technical subjects in 1800.

This original "Mechanics Class" moved to London in 1804, and in December 1823 they also decided to formalize their organization by incorporating themselves as the London Mechanics Institute (later Birkbeck College).
By the mid-19th century, there were over 700 institutes in towns and cities across the UK, the United States, and Australia, some of which became the early roots of other colleges and universities.

Many tradesmen and workers could not afford subscription libraries, so benevolent groups and individuals created "Mechanics Institutes" that contained inspirational and vocational reading matter, for a modest rental fee. Later, popular non-fiction and fiction books were added to these collections. Beyond lending books, Mechanics Institutes also provided lecture courses, laboratories, and in some cases contained a museum for the members' enrichments and education.

Our new Mechanics Institute's focus was revised to provide "*privately-endowed free evening instruction to respectable young men and women to improve themselves in their daily vocations, and to assist those who were obliged to become wage earners before completing their desired education."* Many of the Institute's early alumni became renowned and respected members of industry and society.

Between 1898 and 1903, Andrew Carnegie, a member, contributed over half a million dollars to The General Society. Generous gifts to create our present school came in from other members as well, and by 1913 enrollment at Mechanics Institute had reached 2,300.

Institutional Philosophy

The Mechanics Institute is firmly committed to the belief that by optimizing students' skills in their respective trades, we provide a tangible benefit to the students and their employers and enhance their roles as productive members of society.

Instructors at Mechanics Institute are inspired to teach out of personal pride in their trades and a sincere desire to pass on their experience and knowledge to others. It is for this reason that our Mechanics Institute has long been recognized as a traditional meeting ground where motivated men and women can develop and enhance their abilities under the guidance of accomplished instructors who work in the field.

In achieving these goals, we gain the satisfaction of helping fill the critical needs of those who directly and indirectly reap the rewards of our programs — the graduates, industry, and New York City, of which we are all a part.

Mission Statement

Mechanics Institute's historic existence is founded on the belief that education is the key to life's success. Our steadfast conviction is built on our commitment to help those who are willling to help themselves. To this end, we are dedicated to:

- Preparing the foundation for those willing to rise
- Providing the ladder for those willing to climb
- Fueling the spirits of those willing to soar

MECHANICS INSTITUTE TODAY

BUILD YOURSELF • BUILD NEW YORK

Established in 1858, the Mechanics Institute continues to provide tuition-free evening instruction in trades-related education. It provides a critical service for men and women in the building and construction industry by enhancing knowledge and depth of understanding in their respective trades. This improves job performance and provides career advancement. Without a tuition-free education, many of our students would be unable to get the education needed to advance in today's environment. Each fall, over 300 students enroll in the Mechanics Institute's programs including Electrical Technology, Plumbing & Heating Systems, Construction Project Management, AutoCAD and BIM.

General Facilities and Equipment

When you first visit the Mechanics Institute, your attention is immediately drawn to the building's landmark facade, which was built in 1891 and has been well-preserved over the years. Entering the building, you find yourself facing our Library's oak, brass and glass doors.

To the right is an elevator, which provides visitors with access to the building's six floors. To the left is a sweeping marble staircase, fitted with polished brass handrails and amber-shaded lamps.

The Mechanics Institute administrative offices are located on the First Floor.

ADMISSIONS POLICIES

...the main consideration should be to help those who will help themselves; to provide part of the means by which those who desire to improve may do so; to give those who desire to rise the aids by which they may rise; to assist, but rarely or never to do it all.

- Andrew Carnegie
Benefactor of the Mechanics Institute 1903

Entrance Requirements

Mechanics Institute offers tuition-free technical programs in the following disciplines:

Electrical Technology

Plumbing & Heating Systems

Construction Project Management

HVAC Systems

Applicants may only enroll in the program that is most related to their field of employment. Two programs may not be taken concurrently.

To qualify for admission, applicants must present the following items:

Eligibility Requirements:

- All applicants must be currently employed in the Building and Construction Industry.
- Must have a minimum of two years experience in the Building and Construction Industry.
- All applicants must apply to the program related to their current field.
- Must be a High School, GED, or College graduate.

Admissions Materials:
Applicants must present the following items:

- Letter from employer confirming employment in the Building and Construction Industry (Letter must verify at least two years of experience).
- Copy of high school diploma, GED, or college transcript.
- Photo ID

Applicants accepted to the Mechanics Institute must pay the required fees listed below:

- $100 Registration Fee due every semester
- $75 Student Membership Fee due every year

Credit for Prior Instruction

There is no credit for prior instruction at another academic institution. To satisfy the graduation requirements in each respective programs, students must take and successfully pass the required courses in the sequence prescribed. The Mechanics Institute's Certificate of Completion is only awarded for course work successfully completed at the Institute.

Returning Students

The Mechanics Institute provides updates on its policies, procedures, and requirements with each new edition of the catalog. For this reason, returning students are encouraged to carefully review the most current catalog and become familiar with changes that may be in effect.

Alumni are welcome to return to the Institute to pursue other disciplines. Alumni returning to enroll in a comprehensive program must be employed in that specific field.

Former students who did not complete their program requirements but who wish to continue instruction can reapply after a leave not exceeding three (3) years. *You must have completed your formal withdrawal form during the time of withdrawal. This form must be on file at the Mechanic's Institute office to proceed with registration.*

Registration Fee

The registration fee is $100 per semester. Please note that the registration fee is non-refundable once your courses have been scheduled.

Annual Student Membership Fee

The Annual Student Membership fee is $75 per year. Please note that this annual fee is non-refundable once your courses have been scheduled.

INSTITUTIONAL STANDARDS

Attendance

The Mechanics Institute has a mandatory attendance policy. Attendance is taken by the instructors and submitted to the registrar. Students must be in their assigned classrooms at the start of class and attend the entire session to receive attendance credit.

The Mechanics Institute will allow no more than two absences in each class for the semester. For clarification, on the third absence the student will receive an automatic failure for the class due to attendance issues.

Excused absences will be taken into consideration depending on the excusable situation (such as death in the family, hospitalization, jury duty, or military deployment) if and only if the student notifies their instructor and the Mechanics Institute registrar in advance of the class. Working overtime is not considered an excusable absence. Notification of an excused absence after the fact will not be considered. For excused absences, every two excused absences will count as one absence.

Lateness

Students are expected to be punctual. If a student arrives more than 15 minutes after the official class starting time, on more than two occasions, it will count as one absence.

Dress Code

Students are expected to wear appropriate attire at all times.

Exams, Tests, Quizzes, Assignments and Make-Up Exams

Generally, make up exams will not be given. Special consideration may be given at the instructor's discretion. If a student is absent on a scheduled exam (or quiz/test) day for the class, the student will receive a "zero" for the exam. If a student fails to show up and take the Final Exam, they will receive a "zero" for the exam and due to the final exam weight for the class, it will constitute a failure for the class.

Exam Scheduling and Final Grade Disclosure

Instructors will inform students of their final exam date at least two weeks in advance of the date. The final exam date must be at least one session earlier than the final day of classes. The final day of classes is reserved for review of the final exam (or assignment.) Instructors must also inform students of their final grade for the course on the final class day and obtain signatures from students confirming disclosure.

Assigned Textbooks

At the start of each semester instructors will inform students regarding the textbook that is used for the course. It is required that all students obtain the course textbook.

Grade Equivalents

95 – 100: Excellent
85 – 94: Very Good
75 – 84: Good
70 – 74: Passing
Below 70: Failing

Grade Weightings

All written exams, tests, quizzes, and/or student assignments must be completed in a timely manner. All final grades should be reported by instructors to students and submitted to the registrar on the last day of the semester. **All students must retake and pass any classes failed to graduate.**

Written Exams, Quizzes or Assignments, and Midterms	60%
Punctuality, Attentiveness, Classroom Participation	10%
Final Exam	30%

Grade Disputes

Instructors must provide all students with a syllabus outline at the beginning of the course. If a student believes there exists justification to dispute a grade, he or she must do so within one week of the grade's posting. To do this, the student must meet with the Registrar, who will then arrange a conference with the Director, the student, and the instructor whose grade is disputed.

Course or Schedule Adjustment

When feasible, changes in courses or schedules may be permitted through the first two weeks of the semester.

Course Withdrawal

A student wishing to withdraw from a course must formally notify the Mechanics Institute by completing a Withdrawal Request Form. Such students are considered to have officially withdrawn and may apply to re-enroll in the future.

Official Transcripts

Official transcripts are available upon written request.

Please allow up to ten (10) business days for processing

Student Identification Cards

Identification cards are provided to new students at the start of each semester.

ACADEMIC CALENDAR

Mechanics Institute's academic year consists of a Fall and a Spring semester. Each semester is twelve (12) weeks in duration.

Enrollment applications are accepted during open registration periods only.

Mechanics Institute Hours of Operations

Classes are in session from 5:00 P.M to 8:30 P.M.

Mechanics Institute, **Administrative Offices** operation, are Monday through Thursday from 12 P.M. to 7 P.M and Friday 12 P.M. to 5 P.M.

Holidays Observed

Mechanics Institute is closed during the following holidays on the dates they are officially observed during the Academic Year:

New Year's Day
Martin Luther King Day
Presidents Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veterans Day
Thanksgiving Day
Christmas Day

STANDARDS OF CONDUCT

It is the policy of the Mechanics Institute to maintain a professional environment and a workplace that is free from harassment or intimidation of either a verbal or physical nature. This is not limited to sexual harassment, but includes any harassment based on age, race, national origin, color, handicap, sexual preference, or religion.

Administrative staff, faculty, and students have the responsibility for adhering to acceptable standards of personal behavior and for ensuring that others have the opportunity to carry out their work and assignments in a professional atmosphere.

Drug Awareness/Substance Abuse Policy

In compliance with the Drug-Free Schools and Communities Amendment Act of 1989 (Public Law 101-226), Mechanics Institute, as a matter of policy, prohibits the manufacture and unlawful possession, use, or distribution of illicit drugs and alcohol by students on its property and at any school activity. Any violation of this policy will result in appropriate disciplinary actions, up to and including termination of enrollment. Where it is apparent that a violation of law has occurred, the appropriate law enforcement authorities will be notified.

Cell Phones and Headphones

Classrooms at the Mechanics Institute are NO-PHONE ZONES. Please remove all headphones.

Food Consumption

Eating is prohibited on the School premises. Water, juices, and soft drinks in metal and plastic bottles may be consumed.

Termination of Enrollment

Mechanics Institute reserves the right to immediately terminate the enrollment of any student for any of the following, or similar, actions:

☑ Threatening another student, an instructor, or other employee of the Mechanics Institute
☑ Cheating, stealing, plagiarizing, or similar fraudulent behavior
☑ Disrespectful, abusive, and disruptive behavior
☑ Defacing or damaging Institute property or equipment
☑ Using cell phones anywhere on the Institute premises
☑ Eating anywhere on the Institute premises
☑ Failing to comply with Institute policies or directives as communicated by administrative or instructional staff.

Course Schedules

Mechanics Institute makes every effort to schedule courses in program sequence. At its discretion, and when necessary a course may be canceled.

Certificate of Completion

The Mechanics Institute Certificate of Completion is an optional professional credential awarded to students who successfully complete the courses required by the program in which they are enrolled. The Certificate has no degree equivalence and is not recognized by degree-granting institutions.

Policies and Procedures

At its discretion, Mechanics Institute reserves the right to review these policies and procedures and modify them as it deems necessary.

Commencement Exercises

Commencement exercises celebrating the accomplishments of graduates are held within the historic setting of the General Society‘s Library, located on the ground floor of the building.

Eligibility for Graduation

Students are eligible for graduation when they have successfully:

a) Completed the attendance requirements of the program
b) Completed the course requirements of the program
c) Maintained a final grade of 70% or better in all courses

Awards and Scholarships

Since 1882 the Society has maintained scholarships for the benefit of students of Mechanics Institute. Among these are:

- **George E. Hoe** who served as Past President of The General Society of Mechanics and Tradesmen of the City of New York in 1895. The George E. Hoe Award is awarded to graduates who have demonstrated significant achievement during their enrollment at Mechanics Institute.
- **Albert A. Cuneo** who served as Past President of The General Society of Mechanics and Tradesmen of the City of New York in 1962. The Albert A. Cuneo Scholarship is awarded to graduates who demonstrate excellence in their academic studies at Mechanics Institute. This award provides funding for a course of further study at an academic institution of the student's choosing.
- The **Thomas S. DeNapoli Award**, sponsored by KND Licensed Electrical Contracting & Services Corp., is presented to one outstanding graduate from the Electrical Technology program.
- The **Mortgage Bankers Association of New York Award**, is presented to one outstanding student from each program.
- The **Alan Senzer Award**, sponsored by Alan Senzer, is presented to one outstanding graduate from the Construction Project Management program.
- **Technical Book Awards**, funded by **Leon F. Munier** and **Frank E. Cass**, are presented to deserving HVAC and Plumbing Systems graduates respectively.
- The **American Society of Sanitary Engineering** funds an annual award to one outstanding graduate from the Plumbing & Heating Systems program.
- The **HeatingHelp.com, Achievement Award**, sponsored by Erin Holohan Haskell, is presented to one outstanding graduate for excellence in HVAC.
- The **Penguin, an EMCOR Company, Achievement Award** for excellence in HVAC.

EDUCATIONAL PROGRAMS

Mechanics Institute offers tuition-free instruction to individuals who are employed in the building and construction trades and provides them with the technical knowledge necessary to advance in their respective fields.

While Mechanics Institute is not a trade school, it does offer comprehensive instruction in a wide variety of subject areas related to the building and construction industry.

A multi-tiered curriculum effectively establishes Mechanics Institute as a unique educational facility where the learning needs of every applicant can be satisfied, if not in whole, at least in part. The **Electrical Technology** and **Plumbing & Heating Systems** disciplines that comprise our **technical programs** are expanded and updated on an ongoing basis to ensure their viability and real-world relevance of our program offerings.

Note: All Curriculum is subject to change.

ELECTRICAL TECHNOLOGY PROGRAM

The **Electrical Technology** program is a two-year discipline designed to provide students with a practical understanding of electrical work as it applies to the field of construction. The core courses for the first year of the program focus on Direct Current circuits, where students revisit the rudiments of electrical theory, including Kirchoff's Law, Ohm's Law, and the required technical mathematics.

Subsequent courses provide a thorough exposure to alternating circuit theory, electrical motors, electronics, and cost estimating. The program is rounded out with rigorous course work in commercial and industrial wiring.

Who should enroll in the Electrical Technology program?

Individuals employed as electrician's helpers, as well as those working in any of the diverse fields that rely on an integral understanding of electricity. Those working in these areas in a managerial or supervisory capacity will also benefit from the thorough understanding of electrical code and compliance issues provided by this program.

Please note: The chart below represents a sample course sequence and may not reflect the order in which actual courses are completed.

Year	Semester	Code	Course Name
First	Fall	**EL 101**	**Introduction to the National Electrical Code**
		EL 102	**DC Circuit Analysis**
First	Spring	**EL 103**	**AC Circuit Analysis**
		EL 104	**Electrical Print Reading & Troubleshooting**
Second	Fall	**EL 201**	**Electric Motors & Motor Controls**
		EL 202	**Residential Wiring**
Second	Spring	**EL 203**	**Commercial & Industrial Wiring**
		EL 204	**Electrical Estimating**

EL 101, Introduction to the National Electric Code
Prerequisites: High School Diploma, or GED

This is an introductory course on the use and interpretation of the National Electrical Code (NEC). Students will learn the purpose and history of the code; develop a working knowledge of the code requirements for wiring, over current protection, materials and equipment; be able to discern between wiring methods used in different occupancies, special occupancies, special equipment, special conditions and communication systems; and be able to use the NEC tables to size conduit raceways.

EL 102, Electricity for the Trades 1 - DC Circuit Analysis
Prerequisites: High School Diploma, or GED

This is an introductory course for students in the electrical trade. The objective is for students to understand and perform circuit analysis on Direct Current (DC) circuits. The course will instruct the students on the basics of DC circuit analysis and covers definitions of conductors and insulators, current (I), voltage (V), resistance (R), and resistive circuits, power (P), work, energy, capacity factor, and efficiency. The course includes analysis of series, parallel, and series/parallel DC circuits using Ohm's law and Kirchoff's laws, source conversions, superposition, and Thevenin's and Norton's theorems and equivalent circuits.

EL 103, Electricity for the Trades 2 - AC Circuit Analysis
Prerequisites: EL-102 Electricity for the Trades 1 - DC Circuit Analysis

This is an introductory course for students in the electrical trade. The objective is for students to understand and perform circuit analysis on Alternating Current (AC) circuits. The course builds on what students learned from the DC circuit analysis class but expands to Alternating Current (AC) circuit analysis.

This course introduces students to how alternating current is generated, sinusoidal waveforms, AC power, phasors and phasor analysis of AC circuits with reactance (X) and impedance (Z), capacitance (C), and inductive (L) components. Students will solve simple RC – RL – and RLC circuits, using node, voltage, and mesh current analysis, superposition, Thevenin's and Norton's network theorems and equivalent circuits.

EL 104, Electrical Print Reading & Troubleshooting
Prerequisites: EL-101 Intro. to the NEC

Students are will learn the fundamentals of electrical print reading to include single line diagrams, schematic diagrams, wiring diagrams, connection and raceway diagrams.
Students will learn to read specification manuals and prints as applied to electrical installations in residential, commercial and industrial buildings.

Students will be introduced to some measuring and test equipment and will learn basic troubleshooting skills to determine voltage readings, resistance measurements, circuit continuity, open circuits, short circuits and grounds.

EL 201, Electric Motors & Motor Controls
Prerequisites: EL-103 Electricity for the Trades, and EL-104 Electrical Print Reading and Electrical Troubleshooting

This course is intended to introduce students to the various types of DC and AC motors and also their control circuits, motor contactors, starters, limit switches, and ladder diagrams. Students will also learn to identify and understand symbols used in common control circuit drawings

EL 202, Residential Wiring
Prerequisites: EL-103 Electricity for the Trades, and EL-104 Electrical Print Reading and Electrical Troubleshooting

This course covers residential wiring methods, and implementing the NEC requirements. Installation rules and circuit designs for switches, receptacles, luminaires and appliances will also be discussed.

EL 203, Commercial & Industrial Wiring
Prerequisites: EL-202, Residential Wiring

This course builds on residential wiring and covers commercial and industrial wiring methods, and implementing the NEC requirements. Conductor sizing and various wiring methods and the installation of electrical systems in commercial and industrial occupancies are to be discussed.

EL 204, Electrical Estimating
Prerequisites: EL-101 Intro. to the NEC, EL-104 Electrical Print Reading and Electrical Troubleshooting, and EL-202 Residential Wiring

Students will be taught to professionally and correctly estimate electrical work and submit a competitive bid.

Course topics covered are: Initial review of plans and specifications; set-up of take-off and pricing sheets; formulating Request For Information (RFI); preparing the take-off sheet; preparation of Material & Equipment (M&E) list for vendor pricing; labor values; set-up of and transfer of information to “Recap” sheets; preparing the summary sheet; final senior-level review; and, preparation and submission of the bid.

PLUMBING & HEATING SYSTEMS PROGRAM

The **Plumbing & Heating Systems** program is a three-year discipline intended to provide students with a practical understanding of the NYC Plumbing Code, advanced plumbing theory, and plumbing design concepts as they apply to the field of construction. The core courses for the first year of the program focus on NYC code compliance, where the students are exposed to technical requirements mandated by the Department of Buildings.

Subsequent courses provide a thorough exposure to plumbing estimating, technical drafting, and blueprint reading. The program is rounded out with rigorous course work in plumbing design. Throughout the program, students are able to "personalize" their instruction by choosing elective courses that they find relevant to their current employment and future career objectives.

Who should enroll in the Plumbing & Heating Systems program?

Individuals employed as plumbers' helpers, as well as those working in any of the diverse fields that rely on an integral understanding of plumbing, heating, and sanitary systems. Those working in the plumbing field in a managerial or supervisory capacity will also benefit from the thorough understanding of plumbing theory provided by this program.

Please note: The chart below represents a sample course sequence and may not reflect the order in which actual courses are completed.

Year	Semester	Code	Course Name
First	Fall	**PL 101**	**Introduction to NYC Plumbing Code I**
		PL 102	**Plumbing Theory I**
First	Spring	**PL 103**	**Introduction to NYC Plumbing Code II**
		PL 104	**Blueprint Reading for Plumbers**
Second	Fall	**PL 201**	**Plumbing Theory II**
		PL 202	**Plumbing Design**
Second	Spring	**PL 203**	**Estimating**
		PL 204	**Fire Suppression**

PL 101- Introduction to NYC Plumbing Code I

Prerequisites: High School Diploma, or GED

This beginner course emphasizes the fundamentals of plumbing systems. The students will be required to prepare basic plumbing floor plans and elevation drawings of a low rise building to visualize and understand the various components of the systems.

PL 102- Plumbing Theory I

Prerequisites: High School Diploma, or GED

This course introduces the student to the design of the plumbing and fire standpipe systems, including drafting layouts, application of the New York City Plumbing Code, with special emphasis on sizing, system perimeters, and regulatory requirements, and lectures on the basic principles of hydraulics as applied to the flow of liquids and gases in a piping system.

PL 103- Introduction to NYC Plumbing Code II

Prerequisites: PL 101, PL 102

This course expands on topics from the fundamentals of the plumbing systems. The students will be required to prepare advanced plumbing floor plans and elevation drawings of a low rise building in order to visualize and understand the detailed components of the systems.

PL 104- Blueprint Reading for Plumbers

Prerequisites: PL 102, PL 103

The educational objective of this course is to introduce the plumbing student to the skills of understanding and reading plumbing-related blueprints and construction drawings, and to coordinate the information represented by each type of drawing.

PL 201- Plumbing Theory II

Prerequisites: PL 104

This course is a continuation from the first-year design and layout of plumbing and fire standpipe systems. The student will examine more detail in the design of high-rise multi-zone building with a special emphasis on equipment selection for fire pumps, booster pumps, water heaters, and stormwater drainage system design including site and roof retention and detention.

PL 202- Plumbing Design

Prerequisites: PL 104

An advanced class in the design of plumbing and fire standpipe systems, including shop- drawing layouts with slot and sleeve placement, and location and elevations with respect to benchmarks and building axis lines. The course will cover pressure ratings concerning the gravity and pneumatic pressure tanks for domestic water and fire protection systems.

PL 203- Estimating

Prerequisites: PL 202

Learn all aspects of plumbing, such as a residential and commercial system, the most common plumbing materials and methods, subsystems and component, pricing quantities for an estimate and calculating markup. Also, students will learn about preparing bids, best techniques for using means plumbing cost data, sample takeoff and estimate forms, and budget and assemblies estimating.

PL 204- Fire Suppression

Prerequisites: PL 201, PL 203

An overview of New York City fire sprinkler and standpipe code requirements. A review of building construction and commodity classification and fire chemistry. A breakdown of NFPA 13 with focus on chapters related to design and installation of fire sprinkler system. Analysis of NFPA 13 sprinkler spacing and obstruction rules. Student NICET Level 1 water-based systems layout preparedness.

CONSTRUCTION PROJECT MANAGEMENT

Project Management is the discipline of organizing and managing resources in such a way that these resources deliver all the work required to complete a project within defined scope, quality, time, and cost constraints. As a discipline, Project Management developed from different fields of application, including architecture, construction, and engineering. The forefather of project management is considered to be Henry Gantt, who is acknowledged as the father of planning and control techniques.

Year	Semester	Code	Course Name
First	Fall	**PM ADM**	**Construction Administration**
		PM MDS	**Construction Methods & Materials**
First	Spring	**PM BPR**	**Blueprint Reading**
		PM EST	**Construction Cost Estimating**
Second	Fall	**PM SCH**	**Project Scheduling**
		PM CNT	**Contract Documents**
Second	Spring	**PM SUS**	**Sustainability**
		PM IBC	**International Building Code**

Please note: The above chart represents a sample course sequence and may not reflect the order in which actual courses are offered or completed.

PM ADM Construction Administration

The educational objective of this course is to understand how construction activities are properly managed and executed to achieve successful projects. As a result of new building technologies and evolving construction practices, managing construction is becoming increasingly complex. Topics include bidding and contract award process, quality control, shop drawings, field conditions, and change orders, as well as understanding construction contracts, disputes, and labor relations. Students will work on and prepare real-world documents and contract forms to develop a construction administration portfolio.

PM MDS Construction Methods and Materials

The educational objective of this course is to introduce students to various materials used in construction, with an understanding of how they are used and installed. The course will follow the construction of a building starting with the foundation, through the structure, finishes, and final completion. Students will gain a complete understanding of how buildings stand up and also provide safe, healthy environments for occupants. Students will learn proper construction terminology, code requirements, history and performance of materials, and basic architectural-engineering principles.

PM BPR Blueprint Reading

The educational objective of this course is to introduce the student to the skills of understanding and reading architectural, structural, mechanical and electrical construction drawings, and to coordinate the information represented by each type of drawing.

PM EST Construction Cost Estimating

The educational objective of this course is to introduce the student to estimating for the general construction trades. Major trades covered in class work are excavating, concrete, masonry, carpentry, plastering and tile work. Construction Procedures and trade practices are reviewed. Methods of taking off quantities from Construction Document Drawing and of organizing data are described. Typical problems and homework are analyzed in class. The general approach emphasizes the logical separation of material quantities and work operation, and is applicable to all construction trades.

PM SCH Project Scheduling

The educational objective of this course is to introduce the student to the scheduling aspects of a construction project. The student will learn how to create the initial timing schedule. Topics include scheduling of resources, costs, and personnel/labor. Using manual calculations to develop the schedule will provide the student with background and analysis prior to devoting time and effort to the actual scheduling.

PM CNT Contract Documents

The educational objective of this course is to introduce the student to an understanding of the Nature of Contracts. The Course includes lectures on the bidding for and negotiating of construction contracts, contract administration, as well as handling claims and disputes, changes in the work of contracts, and completion of contracts and payments.

PM SUS Sustainability

The educational objective of this course is to provide the student with a detailed overview of sustainable, or "green", architecture, and construction allowing the student to understand the roles of the designer, builder, and manager in the process. The course balances the theoretical with the practical and presents its topics in a manner that is equally relevant to architects, engineers, interior designers, and construction project managers.

PM IBC International Building Code

The educational objective of this course is to provide the student with a fundamental understanding of the 2018 International Building Code. Students will learn how the code was developed and how it is used, as well as how it applies to building design and construction. Upon course completion, students will have an understanding of Building Codes and how they affect the building and construction industry.

HVAC SYSTEMS PROGRAM

The **HVAC Systems** program is a two-year discipline designed to provide students with a practical understanding of heating, ventilation, and air conditioning concepts as they apply to the field of construction. The core courses for the first year of the program focus on fundamental refrigeration concepts, where students revisit the mechanical functions of condensers, evaporators, compressors, and expansion valves.

Subsequent courses provide a thorough exposure to heat load calculations, electric power supply, and psychometrics and humidification. The program is rounded out with rigorous course work in control systems and applications. Throughout the program, students are able to "personalize" their instruction by choosing elective courses that they find relevant to their current employment and future career objectives.

Who should enroll in the HVAC Systems Design program?

Individuals employed as HVAC mechanics, as well as engineers working in any of the diverse fields that rely on an integral understanding of heating, cooling, and boilers. Those working in the HVAC field in a managerial or supervisory capacity will also benefit from the thorough understanding of refrigeration theory provided by this program.

Please note: The chart below represents a sample course sequence and may not reflect the order in which actual courses are completed.

Year	Semester	Code	Course Name
First	Fall	**HV FUN**	**Fundamentals of HVAC**
		HV HYD	**Hydronic Heating Systems**
First	Spring	**HV H20**	**Water Systems - Water Chillers & Cooling Towers**
		HV HLC	**Heat Load Calculations / Energy Codes**
Second	Fall	**HV DFE**	**Air Systems - Ducts / Fans/ HVAC Equipment**
		HV PSY	**Psychrometrics & Humidification**
Second	Spring	**HV EPS**	**Control Systems & Electric Power Supply**
		HV EST	**Practicum & Estimating**

HV FND: Fundamentals of HVAC –An Overview

The educational objective of this course is to provide the student with an introduction and a broad overview to the heating, ventilation, air conditioning, and refrigeration industry along with its history. Students will be provided with basic theory and specific examples in order to better understand the wide range of systems in use and how they have evolved as well as the direction the industry is going.

HV HYD: Hydronic Heating Systems

Hydronics can be defined as a science that utilizes water or steam to transfer heat from the source where it is produced to an area where it can be used through a closed system of piping. Students will gain a working knowledge of boilers and terminal units used for hydronic heating systems, such as baseboard heaters, convectors, fan coil units, reheat coils and "radiators". Different types of systems and materials used for heating applications will be discussed along with codes and standards that apply.

HV H2O: Water Systems – Water Chillers and Cooling Towers

The removal of heat from conditioned spaces and equipment can be accomplished by different methods, but cooling towers, chillers, heat exchangers and pumps provide a means of providing water to remove heat effectively. Students will learn the difference between different types of cooling towers and chillers as well as common terms associated with water based systems including economizer operation and concerns associated with their operation.

HV HLC: Heat Load Calculations and Energy Codes

The educational objective of this course is to provide an understanding of the basic concepts associated with estimating the heat loss and load used to size equipment for heating and cooling applications. Basic theory will be introduced as it is needed to accurately calculate the rate of heat transfer and temperature changes. Instructional topics include fundamentals of thermodynamics, heat capacity, heat transfer, heat loss and heat gain along with allowances for ventilation, and infiltration.

HV DFE: Air Systems - Ducts & Fans, and HVAC Equipment

The educational objective of this course is to provide the student with a detailed understanding of the fundamentals of HVAC air distribution systems including, fan laws, fan curves and pressure drops. The concepts of the equal friction and velocity methods will be used. This course will also include review and analysis of an existing air distribution systems, indoor air quality concepts and an introduction to the testing, adjusting and balancing (TAB) industry.

HV PSY: Psychrometrics and Humidification

The educational objective of this course is to introduce the student to the properties of moist air and the gas laws as they apply to the HVAC industry. The use of the Psychrometric chart in diagraming the conditions of air as it changes in pressure, volume, temperature, moisture and total energy is the central aspect of this class and students will be given a better understanding of how humidity effects comfort. Total, sensible and latent heat relationships are explained along with wet bulb temperature.

HV EPS: Control Systems and Electric Power Supply

The educational objective of this course is to provide the student with an introduction to the electrical concepts associated with the power requirements for HVAC equipment including electric motors and their control. Some basic HVAC control systems including pneumatic and electronic as well as direct digital controls and their applications within buildings will be studied.

HV EST: HVAC/R Practicum and Estimating

The intention of this class is to give the student the ability to take what they have gained form the program and develop an individual or group term project to pull together ideas as may be applicable to their interests. Site visits to observe the installation and operation of HVAC systems are intended. Also, an estimating approach to the industry will be provided including methods of organizing data.

THE GENERAL SOCIETY OF MECHANICS & TRADESMEN
OF THE CITY OF NEW YORK
Founded 1785

Celebrating Over Two Centuries of Service to the People of the City of New York

ABOUT THE GENERAL SOCIETY OF MECHANICS & TRADESMEN

The General Society of Mechanics & Tradesmen of the City of New York was founded in 1785 by the skilled craftsmen of the City. Today, this 237-year-old organization continues to serve and improve the quality of life of the people of the City of New York through its educational and cultural programs, including its tuition-free Mechanics Institute, The General Society Library, and its nearly two-century-old Lecture Series.

In 1820, The General Society opened one of the City's first free schools, as well as the Apprentices Library. The school, which became the **Mechanics Institute** in 1858, continues to provide tuition-free evening instruction in trades-related education and provides a critical service to improve job opportunities for New Yorkers in the building and construction industry. **Without a tuition-free education, many of our students would be unable to get the technical education needed to advance in today's environment. Each fall, over 300 students enroll in the Mechanics Institute's programs, including Electrical Technology, Plumbing & Heating Systems, Construction Project Management, AutoCAD, and BIM.**

Founded in 1820, **The General Society Library** is the second- oldest library in New York City and one of three remaining membership circulating libraries. It serves the educational programs of The General Society. It also makes its extensive collections available to other institutions and the public. The book and periodical collections of the Library span two centuries and are suited to both scholarly research and recreational reading. Its archives date back to 1785. Library members also enjoy access to current fiction, biography, and non-fiction.

The **Labor, Literature and Landmarks Series** continues a tradition of public lectures that started at the Society in 1837. The Series brings people of diverse interests from the entire New York area into our Library space. Now in its eleventh season, the Artisan Lecture Series pays tribute to the art of craftsmanship by featuring master artisans who lecture about the intricacies of their specialized crafts. **The Artisan Lecture Series** promotes the work and art of skilled craftsmen to assist in ensuring their unique knowledge is understood and carried forth for future generations.

The building at 20 West 44th Street is the fifth home of The General Society. **The Society also houses the unique John M. Mossman Lock Collection, which has more than 370 locks, keys, and tools, dating from 4000 B.C. to the early 20th-century.** The General Society of Mechanics & Tradesmen is listed on the National Register of Historic Places and the façade of the building is a New York City landmark.

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