GREATER LOWELL TECHNICAL HIGH SCHOOL

2025 2026

PROGRAM OF STUDIES

JILL DAVIS - SUPERINTENDENT-DIRECTOR
MICHAEL BARTON - ASSISTANT SUPERINTENDENT/PRINCIPAL

DESIGNED BY SOY DIXON, DESIGN AND VISUAL COMMUNICATIONS, CLASS OF 2026

Core Values

A core value is a central belief deeply understood and shared by every member of an organization. Greater Lowell Technical High School has established a set of core values to guide the actions of all students and staff and that are reflected daily in their performance building quality lives and a positive school culture conductive to learning for all.

All members of the Greater Lowell Technical High School Learning Community will strive to:

R.E.A.C.H.

Respect - We treat ourselves, others and our surroundings with dignity through words and actions

Effort - We work to the best of our abilities to make continuous progress without giving up or giving in

Accountability - We own our words and actions and have the courage to accept responsibility for our decisions

Commitment - We show dedication to our success, our school and our community

Honesty - We act with integrity and value the importance of truthfulness

Disclaimer Statement

This Program of Studies provides a general overview of the programs and courses offered by Greater Lowell Technical High School. The classes and programs described herein are implemented at the school's sole discretion and are subject to change at any time without notice.

Greater Lowell Technical High School

School Committee

Matthew J. Sheehan
Dracut, Chairperson

Paul E. Morin
Dracut, Vice-Chair

Curtis J. LeMay
Lowell, Secretary

Fred W. Bahou Jr.
Lowell

Lee Gitschier
Lowell

Ralph Hogan
Lowell

Steven A. Nocco
Tyngsborough

Raymond Kelly Richardson
Dunstable

Administration

Jill Davis
Superintendent-Director
Michael Barton
Assistant Superintendent/Principal

Ariana Arfanakis	Mathematics and Science Chairperson
Nicholas Beauchamp	Assistant Principal
Stacy Bezanson	Director of Cooperative Education
Valerie Branco	Technology/Allied Health CTE Chairperson
Cheryl Bomal	Title I Facilitator
Jeffrey Carlson	Director of Human Resources
Arthur Cornellier	Transportation & Manufacturing CTE Chairperson
Jamie Costa	Senior Assistant Principal
Tracy Encarnacao	Director of School Counseling
Kristin Foti	Director of Media Services/Professional Development
Erik Gitschier	Director of Plant Services
Gregory Haas	Director of Curriculum, Instruction, and Assessment
Michael Knight	School Business Administrator
Mark LeMay	Construction Technology CTE Chairperson
Lisa Martinez	Director of Technology, Enrollment, and Information
Christine Messina	Director of Practical Nursing
Paul Myette	English Language Arts and Social Studies Chairperson
Kathryn Palladino	Director of Language Acquisition
Kellie Ready	Personal Services CTE Chairperson
Alison Rihani	Director of Special Education
Jennifer Santiago	Assistant Principal
Ronald Vercellone	Dean of Students
Mark White	Athletic Director/Physical Education Chairperson
William J. Collins	Superintendent-Emeritus

Notice of Non-Discrimination in Education

The Greater Lowell Technical High School does not discriminate on the basis of race, color, religious creed, national origin, limited English proficiency, sex, sexual orientation, age, gender identity, criminal record, disability, veteran status, genetic information, pregnancy or a condition related to said pregnancy, parental status and homelessness in the administration of its educational and employment policies, programs, practices or activities, as defined and required by state and federal law. In addition, Greater Lowell Technical High School is committed to providing a work and learning environment free from sex-based harassment and prohibits retaliation against any individual for making a complaint of conduct prohibited under this Notice, or for assisting or assisting in the investigation of such a complaint. The following person has been designated to handle inquiries regarding educational non-discrimination policies:

Name and Title: Tracy Encarnacao, Director of School Counseling/Title IX Coordinator
Address: Greater Lowell Technical High School, 250 Pawtucket Boulevard
Telephone: (978) 441-4955

Notice of Non-Discrimination and Bias in Curriculum

Greater Lowell Technical High School is committed to ensuring an inclusive and equitable learning environment for all students. As part of this commitment, all curriculum and instructional materials are carefully screened and evaluated to ensure that they are free from bias and reflect diverse perspectives and experiences. The goal is to promote a curriculum that is inclusive, respectful of all cultures, and representative of the varied identities and backgrounds of the school community. The school regularly reviews curricular content to identify and address potential bias, ensuring alignment with principles of equity and inclusion.

A MESSAGE FROM THE SUPERINTENDENT-DIRECTOR

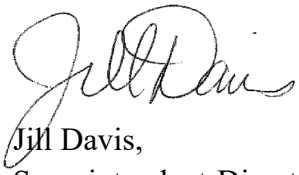
Career and technical education in Massachusetts and the United States has evidenced growth at a dramatic rate. The constant changes in business, industry, and technology continue to provide us with ongoing challenges to update our curriculum in order that we may provide our students with the best course offerings, and instruction, possible.

This Program of Studies reflects the efforts of teachers, administrators, and industry partners to assess our program offerings and to guarantee that our curriculum is current and reflective of the rapidly changing technology. As a result of this concerted effort, our students are exposed to an excellent array of courses designed to make their educational experience at Greater Lowell Technical High School extremely meaningful and worthwhile. An underlying goal of this educational review process is to ensure that our students graduate prepared for success in both post-secondary education and/or career employment. Students are exposed to an integrated program of instruction which provides them with the opportunity to attain the technical, academic, and social skills needed to excel as global citizens.

We urge parents/guardians and students to utilize this Program of Studies throughout the course selection process to determine which programs would best enable them to achieve success as they strive toward meeting their academic and career goals. Students who intend to further their technical training and/or education upon graduation are urged to give strong consideration to the proper selection of courses.

Parents and guardians are encouraged to carefully examine the technical and academic course offerings to assist their student in selecting those courses which most appropriately meet their individual needs, abilities, and interests.

Sincerely,



Jill Davis,
Superintendent-Director

GREATER LOWELL TECHNICAL HIGH SCHOOL

Mission Statement

Greater Lowell Technical High School commits to ensure students' readiness for career, college, and citizenship in the 21st century. We challenge and support students as they realize their individual potential for personal and professional success.

Philosophy

Greater Lowell Technical High School believes in the philosophy and goals of the Massachusetts Common Core of Learning, the Massachusetts Curriculum Frameworks, and the Massachusetts Vocational Technical Education Frameworks to ensure that students attain the **academic and technical skills** required to secure employment, to continue post-secondary studies, or to pursue a combination of both.

Greater Lowell Technical High School provides students with distinct **technical and academic** experiences in a supportive and safe environment to realize a focus for their future.

Greater Lowell Technical High School actively strengthens community and business partnerships with service programs, career and employment opportunities, mentoring programs, advisory boards, grant partnerships, field placements, and volunteerism.

Greater Lowell Technical High School's faculty commits to the highest quality of instruction in both technical and academic areas and the design of extra and co-curricular activities that positively influence students' intellectual, physical, social, and emotional development, to develop leadership, teamwork, and problem solving.

Greater Lowell Technical High School promotes and enhances the learning process by providing academic, technical, and personal/social counseling to facilitate positive student development.

Greater Lowell Technical High School believes that all students regardless of race, color, religious creed, national origin, limited English proficiency, sex, sexual orientation, age, gender identity, criminal record, disability, veteran status, genetic information, pregnancy or a condition related to said pregnancy, and homelessness have the opportunity to succeed through **technical and academic** programs and extracurricular activities.

Goals

Commit to a learning environment that increases student achievement and develops confident learners.

Develop staff and students to think critically and to communicate effectively through educational exercise teamwork, problem solving, and individual responsibility and pride in teaching and learning.

Incorporate proven instructional resources and technology into our technical and academic curriculum to prepare students to adapt to technological change and to broaden their awareness of career opportunities.

Encourage and facilitate increased parent/guardian involvement in the educational process, including extra-curricular activities.

Staff and students will model standards of behavior that cultivate community, respect, and professionalism.

Schoolwide Learning Expectations

Academic and Career

- Staff and students will commit to a learning environment that increases student achievement and develops confident lifelong learners.
- Students will think critically and communicate effectively through educational experiences that exercise teamwork, problem-solving, individual responsibility, and pride in learning.
- Students will demonstrate adaptability and proficiency in academic and technical learning environments.
- Students will model our core values of Effort and Commitment in both academic and technical areas.
- Students will develop employability skills (leadership, reliability, professionalism, time management, etc.).

Social

- Students will develop technical skills that allow them to adapt to technological change, making them more marketable to career opportunities.
- Students will model our core value of Respect, allowing them to develop appropriate relationships with staff and peers.
- Students will learn to work collaboratively with others in both academic and technical areas, and by participating in our Cooperative Education Program.
- Students will cultivate a school culture where respect for diversity and one's social and emotional well-being are honored and embraced.

Civic

- Students will model standards of behavior that cultivate community, respect, and professionalism.
- Students will model our core values of Honesty and Accountability, allowing them to be productive members of our school community and society.
- Students will demonstrate an awareness of their community and civic responsibilities by participating in service learning opportunities and SkillsUSA.

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Sample Schedules/Course Assignments

SAMPLE FRESHMEN SCHEDULE/COURSE ASSIGNMENTS
Courses may be adjusted for individual students to meet their learning needs

PERIOD	A WEEK	X WEEK
1 (44 Minute)	**English** 6.0 Credits	
2 (44 Minute)	**Math** 6.0 Credits	
3 (44 Minute)	**Science** 6.0 Credits	
4 (44 Minute)	**Social Studies** 6.0 Credits	
5 (22 Minute)	**Digital Literacy** 6.0 Credits	
6 (22 Minute)		
7 (22 Minute)	Lunch	
8 (22 Minute)	**Physical Education/Health** 6.0 Credits	
9 (22 Minute)		
10 (44 Minute)	**Exploratory/Shop 1** 12.0 Credits	
11 (44 Minute)		

Total Required Credits for Freshmen Year = 48.0

SAMPLE SOPHOMORE SCHEDULE/COURSE ASSIGNMENTS
Courses may be adjusted for individual students to meet their learning needs

PERIOD	A WEEK	X WEEK
1 (44 Minute)	**English** 6.0 Credits	**Career and Technical Education** 21.0 Credits (total)
2 (44 Minute)		
3 (44 Minute)	**Math** 6.0 Credits	
4 (44 Minute)	**Physical Education/Health** 3.0 Credits	**Career and Technical Education** 21.0 Credits (total)
5 (22 Minute)	**Social Studies** 6.0 Credits	
6 (22 Minute)		
7 (22 Minute)		Lunch
8 (22 Minute)		**Career and Technical Education** 21.0 Credits (total)
9 (22 Minute)	Lunch	
10 (44 Minute)	**Science** 6.0 Credits	
11 (44 Minute)		

Total Required Credits for Sophomore Year = 48.0

SAMPLE JUNIOR AND SENIOR SCHEDULE/COURSE ASSIGNMENTS
Courses may be adjusted for individual students to meet their learning needs

PERIOD	A WEEK	X WEEK
1 (44 Minute)	**English** 6.0 Credits	**Career and Technical Education** 21.0 Credits (total)
2 (44 Minute)		
3 (44 Minute)	**Math** 6.0 Credits	**Physical Education/Health** 3.0 Credits
4 (44 Minute)		**Career and Technical Education** 21 Credits (total)
5 (22 Minute)	**Science OR Social Studies** 6.0 Credits	
6 (22 Minute)		
7 (22 Minute)		Lunch
8 (22 Minute)		**Career and Technical Education** 21.0 Credits (total)
9 (22 Minute)	Lunch	
10 (44 Minute)	**CTE Theory** 6.0 Credits	
11 (44 Minute)		

Total Required Credits for Junior and Senior Year = 48.0 Each

Programs and Services

College Preparatory Program

Greater Lowell Technical High School offers a Massachusetts High School Program of Studies (MassCore) which is intended to help high school graduates arrive well-prepared for college. Courses included in MassCore are rigorous, engaging, and are aligned to the Massachusetts Curriculum Frameworks high school level standards. The recommended MassCore program of studies includes four years of English, four years of math, three years of lab-based science (a fourth year of science is offered in lieu of one year of the Foreign Language and Arts college admission requirement), three years of social studies, physical education, and vocational program credits (in lieu of one year of the Foreign Language and Arts college admission requirement). Students are scheduled into academic classes based on their course of study. Changes in schedules should not occur beyond the end of the 2nd quarter. The only exceptions would be if a student is serviced under an Individual Education Program, or 504 Accommodation Plan.

In order to meet admissions standards for Massachusetts State Colleges and Universities (four-year colleges) student should complete the following courses:

1. Four courses of college preparatory English
2. Four courses of college preparatory mathematics
3. Three courses of lab-based college preparatory science
4. Two courses of college preparatory social studies (including one course in U.S. history, and one course in world history)
5. Two years of technical program Theory courses plus one additional course in mathematics, science (no lab required), or computer science are accepted in lieu of foreign language for admissions to Massachusetts State Colleges and Universities.
    a. It is strongly encouraged that students interested in college meet with their counselor for academic counseling during course selection starting in their sophomore year to ensure they are on track for junior academics and college planning.
    b. Students interested in applying to a four-year college/university should schedule an appointment with their school counselor during their junior year to ensure they are on track to meet admissions requirements specific to the colleges/universities they are applying to.

Academic Levels

Greater Lowell Technical High School has high standards and expectations for **all** students, at **all** course levels. Course placement for students is determined based on the individual needs of each student taking into consideration: teacher recommendations, grades, district and state assessments, student interest, parent input, and the school counselor's professional guidance based on all factors. The academic levels available at Greater Lowell Technical High School are as follows:

Advanced Placement (AP) – Intended for highly motivated students who wish to take challenging college-level courses while in high school. Students that are planning on attending a two or four-year college will have the opportunity to experience a college-like class while receiving the support of highly qualified educators. Students who enroll in Advanced Placement courses are responsible for taking the AP College Board exam for that class.

Early College (EC) and Dual Enrollment (DE) – Designed for highly motivated college-bound students who have strong academic skills. These courses are in partnership with local colleges and universities and upon successful completion, students can receive college credit.

Honors – Designed for highly motivated college-bound students who have strong academic skills. These courses are fast-paced and rigorous, and require consistent effort and the ability to work independently.

College Preparatory (CP) – The curriculum contains much of the core content as honors classes. Intended for college-bound students and for those students who wish to keep their post-secondary options open. Students in CP courses will develop a strong foundation of content and skills based on the Massachusetts Curriculum Frameworks.

Grade Point Average (GPA) Calculation

Greater Lowell Technical High School uses a cumulative, weighted 4-point GPA calculation recommended by the Massachusetts Board of Higher Education. Grade point averages are calculated based upon the grades earned in all high school level academic, technical, and exploratory courses. Grades earned in College Preparatory (CP) and technical courses do not receive extra weight. Grades earned in Honors, Advanced Placement (AP), and Early College and Dual Enrollment courses receive additional weight.

Calculating the weighted GPA

Step 1. Convert each final, numeric grade to its equivalent on the 4-point scale.
Step 2. Weight grades by adding 0.5 to each converted grade earned in an Honors level course, and 1.0 to each converted grade earned in an Advanced Placement, Early College, or Dual Enrollment course.
Step 3. Multiply each converted grade by the course credits earned. (Each course is assigned a specific number of credits based on the length and hours of the course.)
Step 4. Total the products from Step 3.
Step 5. Divide the total from Step 4 by the total number of course credits attempted.
Step 6. The quotient is the student's weighted GPA.

Conversion between numeric and 4-point grades:

Numeric Grade	4-Point Scale		Numeric Grade	4-Point Scale
100	4.3		79	2.6
99	4.3		78	2.5
98	4.2		77	2.4
97	4.2		76	2.3
96	4.1		75	2.2
95	4.1		74	2.1
94	4.0		73	2.0
93	4.0		72	1.9
92	3.9		71	1.8
91	3.8		70	1.7
90	3.7		69	1.6
89	3.6		68	1.5
88	3.5		67	1.4

87	3.4		66	1.3
86	3.3		65	1.2
85	3.2		64	1.1
84	3.1		63	1.0
83	3.0		62	0.9
82	2.9		61	0.8
81	2.8		60	0.7
80	2.7		59	0

Course Requirements

All students are required to take four years of English, four years of mathematics, three years of lab-based sciences, two years of history/social sciences, and three years of a technical program. Students must receive a passing grade in English all four years, three years of mathematics, two years of lab-based science (freshman and sophomore), and two years of history/social science in order to graduate from Greater Lowell Technical High School.

Students must also pass their technical program to be promoted to the next technical level. Students who do not pass their technical program may not receive a technical certificate at graduation. The only exceptions would be a student who may be serviced under an Individual Education Program, a 504 Accommodation Plan, or receiving English Language Education services. All decisions regarding these students are made by teams as required by Special Education, Section 504, and English Language Education regulations.

It should be noted that a student who fails Algebra 1 or Algebra 2 must attend summer school and participate in a mandatory afterschool competency-based program during the next school year to ensure that they remain on the track to meet admissions standards for Massachusetts State Colleges and Universities.

Massachusetts Competency Determination (CD) Requirements – A student receives Competency Determination (CD) when they meet state-mandated MCAS scores in English, mathematics, and science (Biology). Students may be placed on an Educational Proficiency Plan, which requires them to successfully complete and pass English and mathematics if their scores fall within state-determined achievement levels.

English Learner Program

Under the guidelines of M.G.L c. 71A, Greater Lowell Technical High School provides educational services to students who are identified as English learners. The goal of the program is to help students increase their academic proficiency in English in order to achieve success in all interdisciplinary courses. All students in the EL program receive intense instruction in English as a second language. In addition, ESL instructional support is provided by teachers and paraprofessionals in academic, technical, and related classes in order to ensure student success in those courses. The specific amount of two-way instruction and tutorial support is based on the linguistic needs of each student.

School Counseling Services

The School Counseling Department at Greater Lowell Technical High School assists each student in reaching their potential in the attainment of a high school diploma by providing academic, technical, and personal support. Whether the student plans to immediately enter the workforce or continue their education on the post-secondary level, school counselors will monitor each student to ensure that individual career and college goals

may be achieved. A Career Inventory Survey is administered to all freshmen through Naviance to assist them in choosing the technical program that best suits their interests and abilities. Freshmen begin creating a career plan that they update every school year with the assistance of their school counselor to provide them with a comprehensive college and career plan.

The School Counseling Department at Greater Lowell Technical High School assists each student with gaining insight into their environment, needs, and potential so that choices and decisions made will culminate in a successful and satisfying academic and career path.

School counselors provide a variety of student and community-based services including, academic, career, and post-secondary planning, and crisis intervention/resources. The School Counseling Department offers a comprehensive program consisting of individual and group sessions with students, as well as parent/guardian informational presentations. The administration, school counselors, teachers, and students work together to promote the best interests of the school and the individual student. The focus of the school counselor is to work with the students and their parents/guardians in matters pertaining to academic advising, post-secondary planning, and personal/social counseling. This could include adjustment to school, registering for courses, placement in classes, college and career exploration, testing, tutoring, and personal/emotional issues. School counselors have access to a wide variety of community and collegiate resources in order to provide the students with the best possible options for all their needs. **Students should make appointments to see their school counselor unless the reason for the meeting is of a critical nature.** Parents/guardians are encouraged to call or email their student's school counselor to make an appointment to discuss any areas of concern. Conferences may be arranged before or after school or at designated times during the school day.

Students who are referred for school adjustment counselor services may be issued a series of assessments to help determine the focus for these appointments. The goal of the school adjustment counselor is to improve access to the curriculum by increasing coping skills for students struggling with social-emotional difficulties, thereby increasing time in classes. If you do not wish your student to engage in any assessments, please inform your student's school counselor in writing to opt out.

Student Course Selection

Students attending Greater Lowell Technical High School will meet with their school counselor to select courses for the next school year. Students and parents are requested to examine the Program of Studies before meeting with their school counselor to select courses that meet their individual needs. A student who will be pursuing education on the post-secondary level should discuss course selection with their school counselor on a frequent basis to ensure that college admission requirements are met.

College and Postsecondary Planning

School counselors assist students in the following ways:

- Course selection
- 4-year career planning
- Guided Naviance Student activities
- College and career search process
- College majors and related careers

- PSAT/SAT/CT/AP/ASVAB testing
- Resume/essay writing
- College visits and interviews
- Financial aid/scholarships

Students are encouraged to utilize the resources available in the School Counseling Department to assist them in this process.

Naviance Student

Naviance Student from Naviance is a web-based service designed especially for students and parents. It is a comprehensive website that students and parents can use to help make decisions about colleges, careers, and post-secondary plans. Each student has a profile on Naviance Student and is linked directly to the School Counseling Department so that the school counselors can monitor each student's progress in the career and college planning process.

Family Connection allows students and families to:

- Get involved in the planning and advising process: build a resume, complete online surveys, and manage timelines and deadlines for making decisions about careers and post-secondary options.
- Research hundreds of careers and career clusters as well as take career assessments and interest inventories.
- Research colleges and compare GPA, standardized test scores, and other statistics to actual historical data from our school for students who have applied to colleges of interest in the past.
- Create goals and "to-dos", and complete tasks assigned by the school to better prepare students for future career and college goals.
- Track transcripts and recommendations

Naviance Student also supports the sharing of information with students and parents/guardians through email about upcoming events and meetings, local scholarship opportunities, and other resources for college and career exploration. We are pleased to offer Naviance Student to our students and their families as it creates a rich and meaningful pathway to maximize the opportunities to create an individual career plan and pathway to success for the student.

To access our school's Naviance Student site, please visit: http://connection.naviance.com/glths
Each student and parent will have their own access code to this site; however, you may also access it as a guest by using the guest password: gryphon.

Library Media Center (LMC)

The Library Media Center's (LMC) mission is to provide an inviting and dynamic environment with series and resources that support and enhance literacy, collaboration, and lifelong learning

The LMC team's priority is to provide students with up-to-date fiction and non-fiction materials and computer resources to encourage students to read, imagine, be informed, and be successful. The LMC also offers an extensive number of online multimedia databases that are available to students, parents/guardians, and teachers, both at school and home. Resources are accessible through the LMC website at https://www.gltech.org/library.

The LMC's environment is designed to promote learning for individuals or groups. The Library Media Center is open before and after school, and throughout the day with a pass.

Special Education Department

Under Federal Law IDEA (Individuals with Disabilities Act) and Massachusetts General Law c.71B/CMR (Code of MA Regulations) 603 28.00, the Greater Lowell Technical High School provides comprehensive programming for students with disabilities under Individual Education Programs. Services include content area inclusion classes, and study skills support for academic instruction received in the general curriculum. In addition, related services such as speech therapy, individual and group problem-solving therapy, and full evaluation services are also provided.

Section 504

Under Section 504 Civil Rights Law protecting the rights of individuals, the law identifies all school-aged children as handicapped who meet the definition of a "qualified handicapped person". A student may be eligible for Section 504 Accommodations, if they have or had a physical or mental impairment that substantially limits a major life activity, which includes walking, hearing, seeing, speaking, breathing, learning, caring for one's self and performing manual tasks. The handicap condition need only substantially limit one major life activity in order for the student to be eligible. A comprehensive resource regarding 504 is available on the Massachusetts Department of Elementary and Secondary Education (MA DESE) at the following link: https://www.doe.mass.edu/sped/links/sec504.html

Parent(s)/Guardian(s) should contact the Director of School Counseling/Section 504 Coordinator at 978-441-4955 or 4952 regarding the process for requesting a Section 504 Accommodation Plan review.

Exploratory/Freshmen Program Overview

Exploratory Program

The Exploratory Program provides ninth-grade students with the opportunity to learn about all twenty-three (23) career and technical programs offered at Greater Lowell Technical High School. Students will spend two periods a day for six (6) days in each program. This model enables students to discover their personal strengths and interests, and compare those with the work skills and requirements of the various career and technical programs. Students are encouraged to consider training in any program, without regard to traditional stereotypes. At the end of each exploratory rotation, students will receive an evaluation score which is used for final program placement. Exposure to all twenty-three (23) career and technical programs will enable students to make a more informed decision when making their final technical program choice. In the fourth marking period, students will select one of the programs to pursue for the remainder of their high school experience. It is important that parent(s)/guardian(s) assist their student with the selection process.

Shop Selection Procedure

The following selection procedure is used to determine permanent Shop placement for ninth grade students:

1. Students complete a Permanent Shop Selection Form listing their first through fourth choices in the order of preference.
2. A list of students for each Shop is generated based on all student requests starting with students who scored the highest in each of the exploratory programs to the lowest. Students who have the highest scores will be placed into their Shop selection first when over-enrollment to a Shop occurs.
3. Students who do not get into their first Shop choice will be placed into their second Shop choice, if there is an opening available. If the student's second choice selection is over-enrolled, then they will be placed into their third Shop choice.
4. When two students have the same score and are vying for the last Shop placement the student's average of all exploratory Shop scores is considered first and student attendance is considered second to determine placement.

Exploratory Programs Offered

Auto Collision Repair & Refinishing
Automotive Technology
Carpentry
Computer Aided Drafting & Design
Cosmetology
Culinary Arts
Design & Visual Communications
Early Childhood Education
Electrical
Electronics Engineering
Engineering Technology
Graphic Communications
Health Assisting/Pre-Nursing
Heating, Ventilation, Air Conditioning & Refrigeration
Hotel, Restaurant, and Tourism
Information Technology Services
Marketing
Masonry
Medical Laboratory & Assisting
Metal Fabrication & Joining Technologies
Painting and Design
Plumbing
Veterinary Science

Shop 1

Ninth-grade students will begin to pursue the study of their selected technical program following April school vacation. The Shop 1 course will be two periods per day for the entire marking period. Heavy emphasis will be placed on Shop safety and basic Shop concepts during this time.

Digital Literacy and Citizenship

Digital Literacy and Citizenship will prepare students to use technology responsibly and proficiently in school, the workplace, and everyday life. The course will teach students how to work in an internet-rich environment and be responsible digital citizens.

The course consists of four main components: ***Technology, Career and Financial Literacy, Research Writing, and Civics***. Students will explore concepts from each module of the course. In Technology, students will learn how to responsibly navigate, evaluate, and create content in digital environments, and maintain a healthy balance on social media while understanding the ethical implications of their online behavior. In Career and Financial Literacy, students will explore career options in order to develop a career portfolio and demonstrate an understanding of financial concepts and applications. In Research Writing, students will explore how to write in MLA format and identify where to find reliable information online. In Civics, students will discern between fake news and real news and learn what responsible online civic participation looks like. All students will design a digital portfolio throughout the year that includes: An About Me page, artifacts from each course, and self-reflections.

Students will explore the essential questions: “How can I access and use digital information safely and ethically?” and “What are the rights and responsibilities of a digital citizen?” Students will earn 1.5 credits upon completing each component of the course.

Grades 10-12 Technical Program Overview

Each student in grades 10-12 specializes in a technical program based upon their interests and abilities. Each program operates on an alternating week basis allowing students to spend one (1) week in Theory/academic classes and one (1) week in their technical program. The technical programs at Greater Lowell Technical High School are organized by a cluster concept. Listed below are the twenty-three technical programs and the cluster they fall under:

Advanced Manufacturing - Manufacturing & Transportation

Automotive Collision Repair & Refinishing - Manufacturing & Transportation

Automotive Technology - Manufacturing & Transportation

Carpentry - Construction Technology

Computer-Aided Drafting & Design - Manufacturing & Transportation

Cosmetology - Personal Services

Culinary Arts - Personal Services

Design & Visual Communications/ Technology - Allied Health

Early Childhood Education - Personal Services

Electrical - Construction Technology

Electronics Engineering - Manufacturing & Transportation

Engineering Technology - Manufacturing & Transportation

Graphic Communications - Technology/Allied Health

Health Assisting/Pre-Nursing - Technology/Allied Health

Heating, Ventilation, Air Conditioning & Refrigeration - Construction Technology

Hotel, Restaurant, and Tourism - Personal Services

Information Technology Services - Technology/Allied Health

Marketing - Personal Services

Masonry - Construction Technology

Medical Laboratory & Assisting - Allied Health/Technology

Metal Fabrication & Joining Technologies - Manufacturing & Transportation

Painting & Design - Construction Technology

Plumbing - Construction Technology

Technical Program Course Descriptions

Advanced Manufacturing

Advanced Manufacturing Shop 2
Advanced Manufacturing Shop 2 provides reinforcement in the importance of improved tolerances on the size and surface finish of machined parts. Instruction is provided on personal safety equipment and safe working standards used in today's machine Shops. Operation of hand tools, portable power tools, precision measuring equipment, manual lathes, manual milling machines, CNC turning centers, CNC milling centers, pedestal grinders, power saws, and drill presses are also covered. Instruction also includes an introduction to the latest Mastercam software for computer-aided machining.

Advanced Manufacturing Shop 3
Advanced Manufacturing Shop 3 provides reinforcement and further development of machine Shop skills. Bench work, drill press, manual and CNC milling and turning, grinding, finishing, and holding tolerances, measurement, and inspection are all included. The course combines both technical knowledge and hands-on experiences in the manufacturing of products. Students will be introduced to the proper setup and use of high-tech CNC Machines, including HAAS and Kitamura machines. Students also learn basic programming with the latest software in use by local industries.

Advanced Manufacturing Theory 3
To further enhance work being performed in the Shop, Advanced Manufacturing Theory 3 includes an introduction to thread cutting, types of files and saws, and the use of milling machines and milling cutters, along with a study of ferrous and non-ferrous metals. Proficiency will be gained in blueprint reading and sketching. Students will learn advanced programming techniques as they write NC programs for the CNC lathe and machining center using G codes & M functions.

Advanced Manufacturing Shop 4
Advanced Manufacturing Shop 4 is an advanced and more intensive study of machining. Included in the course are both setup and operation of CNC vertical and horizontal machines, basic programming with Mastercam software and G-codes, layout, close tolerances, finishing, and production requirements. Students are taught the skills needed to obtain a career in the machining trade.

Advanced Manufacturing Theory 4
Included in Advanced Manufacturing Theory 4 is instruction related to different threads, precision thread measurement, gauging and tolerancing, use of machine handbooks, taper turning, allowances, and tolerances. Also included are studies of surface finishes, geometric tolerancing and dimensioning, and advanced blueprint reading. Students will be taught to write NC programs, as well as interfacing procedures for the CNC milling machine. Programming of the ProtoTrak MX3 milling machine is also part of this course.

Career Opportunities in Advanced Manufacturing:

Entry-Level Occupations

Band Saw Operator
Drill Press Operator
Lathe Operator
Machine Operator
N.C. Miller Operator
Surface Grinder Operator

With Experience and/or Advanced Training

CNC Machine Programmer
Inspector
Instrument Maker
Jig Borer
Jig and Fixture Maker
Machine Setup Person
Advanced Manufacturing Teacher
Tool and Cutter Grinder
Tool and Die Maker

Related Occupations

Machine Oiler
Material Handler
Tool Crib Attendance

Automotive Collision Repair and Refinishing

Automotive Collision Repair & Refinishing Exploratory
This course emphasizes the basic skills needed in the automotive collision repair and refinishing trade, as well as the use of related tools, application of procedures, and current repair techniques. Each student gains working experience in the use of various tools and equipment required in this technical area. Our technical media system and the use of visual aids, as well as hands-on experience, provide students with an excellent introduction to all various career opportunities within the automotive collision industry.

Automotive Collision Repair & Refinishing Shop 1
The Automotive Collision Repair & Refinishing Shop 1 provides students with an in-depth knowledge of automotive collision repair procedures, employability skills, proper use of spray-painting equipment, surface preparation, mixing and applying fillers, care and use of power tools, various methods of dent removal, damage evaluation, and Shop procedures.

Automotive Collision Repair & Refinishing Shop 2
This course provides students with the opportunity to acquire skills and knowledge in Shop safety, industry understanding, Shop procedures, vehicle construction, care and uses of power tools, hand tools, Shop equipment, body and frame construction, metalworking, care and use of spray guns, spray equipment, refinishing materials, surface preparation, disassemble and reassembly, The evaluation and repair of metal and plastic panel damage. Vehicle damage analysis, estimating, paint and parts identification are also covered. All Shop projects are based on the I-CAR curriculum.

Automotive Collision Repair & Refinishing Shop 3
The Automotive Collision & Refinishing Shop 3 program provides the student with a more in-depth study of automotive collision repair and refinishing. Students will be exposed to hands-on and live collision repairs during the entire course. Additional topics of instruction include analyzing and repairing areas of collision damage, frame and unitized body repair utilizing the Maxima 3000 HE body alignment system, and the Eclipse laser frame measurement system. Students will begin exploring collision welding procedures using various methods that include, MIG, silicon bronze, pressure spot welding, and aluminum and plastic welding. Additional skills and knowledge of fiberglass repair, plastic body repair, repair to electrical systems, suspension service, and heating and cooling systems will also be covered. Qualified students will have an opportunity to participate in the school's cooperative education program working in a live Shop during Shop week. All Shop projects and studies will be based on I-CAR Curriculum.

Automotive Collision Repair & Refinishing Theory 3
This class includes automotive collision-specific safety practices, I-CAR training, and further instruction on fasteners, measuring procedures, hand tools, power tools, analyzing structural damage, and cutting and welding. Students will begin work on their I-CAR transcript that is extremely valuable within the industry.

Automotive Collision Repair & Refinishing Shop 4

The Automotive Collision & Refinishing Shop 4 course provides the students with complete coverage of advanced automotive body repair, both major and minor, and most advanced types of paints used today, as well as methods of application. Other areas covered in this course include analyzing and repairing major collision damage, MIG welding, resistance spot welding, plastic welding, adhesive bonding, structural alignment, and repair, determining when to repair or replace parts, estimating, and preparing for job interviews. Automotive Collision & Refinishing Shop 4 students may also become eligible to enter the cooperative education program. All Shop projects will be based on the I-CAR curriculum.

Automotive Collision Repair & Refinishing Theory 4

This class includes refinishing procedures, refinishing equipment, and refinishing materials. Students will learn about solvent-based paints as well as waterborne paints. Students will be provided with instruction in employability and job interviews. A list of valued industry-relevant certifications that all students will have an opportunity to earn is available. The goal of the Automotive Collision Repair & Refinishing program is to provide all qualifying students who desire cooperative education an opportunity to do so.

Career Opportunities in Automotive Collision:

Entry-Level Occupations

Automotive Collision Frame Alignment Apprentice
Automotive Collision Recondition Person
Auto Collision Metal Repairperson
Auto Collision Spray Painter

With Experience and/or Advanced Training

Automotive Collision Frame Specialist
Automotive Collision Paint Specialist
Automotive Glass Installer
Automotive Collision Insurance Adjuster
Automotive Collision Shop Manager
Automotive Collision Teacher

Related Occupations

Small Engine Repairer
Custom Painter
New and Used Car Lot Attendant
Insurance Appraiser
Automotive Supply Store Person
Custom Metal Fabricator
OEM & After Market Parts Specialist
Automotive Engineer

Automotive Technology

Automotive Technology Exploratory
This exploratory program introduces students to the many opportunities available in the automotive industry. The course consists of units in Shop safety, basic tool identification, and operation of Shop equipment. Hands-on learning is emphasized. Students have the opportunity to learn basic automotive repair by working on vehicles and training aids that have been donated by private industry. This is a very stimulating course in one of the fastest-changing industries in the country.

Automotive Technology Shop 1
Automotive Technology Shop 1 is a continuation of the exploratory program. Students receive an in-depth study of engine operation, drive trains, and basic automotive electrical systems. This course provides students with a basic but very sound background in automotive repair.

Automotive Technology Shop 2
Automotive Technology Shop 2 reviews skills acquired during the Automotive Technology Shop 1 experience and concentrates on diagnosing engine and running gear problems; also included are fuel injection and front alignments. The students are familiarized with the practices and customs used in industry. Areas of concentration include electrical, engine performance, engine mechanical, engine measurement, and digital multi-meters. Along with computer-based training, students are prepped with employability skills enabling them to participate in the cooperative education program which is affiliated with the Automotive Youth Educational System (AYES).

Automotive Technology Shop 3
Automotive Technology Shop 3 provides students with an in-depth study of under car systems, maintenance procedures, and performance operations, involving state-of-the-art diagnostic testing and maintenance equipment, preparing the student for possible co-op opportunities. The Automotive Technology Shop 3 program is enhanced with Identifix, ALLDATA, and Mitchell Computer-Based Learning.

Automotive Technology Theory 3
Automotive Technology Theory 3 consists of classroom Theory using the Massachusetts CVTE frameworks and standards. A complete review of engine repair, heating, air-conditioning, manual and automatic drive trains are included. Computer control systems are incorporated through up-to-date text and computer-related programs as well as the SP2 Safety Program. GLTech's Automotive Technology Program maintains an association with AYES (Automotive Youth Education System), ASE (Automotive Service Excellence), and NATEF (National Automotive Technical Foundation). Heavy emphasis is placed on preparing students for cooperative education opportunities within the community.

Automotive Technology Shop 4
Automotive Technology Shop 4 reviews skills acquired in previous levels and concentrates on diagnosing engine and running gear problems. Also included are the diagnosis of computer-controlled ignition, fuel injection, and pollution controls as well as front alignment. The students are familiarized with the practices and customs used

in industry. Areas of concentration include electrical, electronics, and engine performance, engine mechanical, engine measurement, scan tools, and digital multi-meters. Along with computer-based training, students are prepped with employability skills enabling them to participate in the cooperative education program which is affiliated with the Automotive Youth Educational System (AYES).

Automotive Technology Theory 4

Automotive Technology Theory 4 reviews previously acquired skills. Students review Shop safety, proper use of tools and equipment. Concentrations on steering, suspension, braking systems, running gear, engines, and electrical systems are reviewed and enhanced. Vehicle maintenance and repair are stressed as the students become familiarized with the practices and customs used by the automotive industry. Emphasis is placed on customer relations, repair orders, and the automotive industry. Documentation is explored with electronic service information (Mitchell on Demand). Students' employability skills are reinforced enabling them to participate in the cooperative education program which is affiliated with Automotive Youth Education System (AYES).

Career Opportunities in Automotive Technology:

Entry-Level Occupations

Brake and Exhaust Repair Person
General Automotive Technician
New Car and Warranty Technician
Quick Lube Technician

With Experience and/or Advanced Training

Automotive Repair Shop Owner
Electronic Diagnostic Specialist
Factory Representative
Service/Parts Manager
Automotive Service Consultant/Advisor
Automatic Transmission Specialist
Electronic Tune-up Specialist
Front End Alignment Specialist
Teacher

Related Occupations

Automobile Salesman
Automotive Glass Installer
Automotive Engineer
Automotive Parts Salesperson
Small Engine Repair
Insurance Appraiser

Carpentry

Carpentry Exploratory
The exploratory program introduces the student to career opportunities in the carpentry field. The course offers a brief exposure to measuring instruments, hand tools, portable and stationary woodworking equipment, and building materials. Students will begin developing the skills needed to become proficient in the carpentry field by constructing projects that they will take home.

Carpentry Shop 1
Carpentry Shop 1 offers a greater in-depth view into the use of basic trade tools, measuring instruments, and materials through real-life experience performance projects within the Shop. This, in conjunction with the related Theory, cultivates awareness in the student of additional aspects of the carpentry field.

Carpentry Shop 2
At this level, students are instructed in safety factors and the proper use of selected power machines. They will learn to identify, estimate and properly store lumber and building materials. The first two terms will be focused on Shop and tool safety, woodworking practices, and Shop techniques. During the third and fourth terms, emphasis will be placed on house building and basic framing.

Carpentry Shop 3
At this level, students gain experience constructing residential house-building projects that may be on or off-campus. Rough and finish carpentry performance skills will include house framing, roofing, and siding. Students will install windows and doors, trim rooms, and install kitchen cabinetry. Students will learn to erect scaffolding and stage work areas. A great deal of time is spent studying and performing safety standards as applied in the construction field. High-performing students may become eligible to participate in the cooperative education program, beginning the month of February, should the opportunities arise.

Carpentry Theory 3
Students in Carpentry Theory 3 will be exposed to up-to-date information on building materials and techniques. Detailed coverage of all aspects of light framing construction, including site layout, foundation forming, sheathing, roofing, windows and doors, exterior finish, interior walls, floor, and ceiling. Special emphasis is placed on the use of modern tools, materials, and prefabricated components. Carpentry Theory 3 uses Modern Carpentry, 13th edition.

Carpentry Shop 4
Carpentry Shop 4 students will each have the opportunity to participate in the cooperative education program, provided they are eligible. The student will learn the trade from a cooperative education employer who will report back to the school on the tasks performed and the level of competency achieved during the week. Students remaining in school will learn to set up woodworking machinery to do production work while learning the care and maintenance of woodworking tools. The students will also work outside of the Shop doing carpentry maintenance and remodeling work as needed inside and outside of the school campus. Students will

support the junior building programs and may also work for the communities of Lowell, Dracut, Tyngsborough, and Dunstable.

Carpentry Theory 4

In Carpentry Theory 4, students will study advanced framing techniques, exterior, and interior trim. The international residential code book will be used to cover Strand 2 Part 2.B.06 and applicable state and local building codes including the stretch code part of Strand 2 Part 2K.01 energy-efficient systems in the carpentry frameworks. Carpentry Theory 4 uses Modern Carpentry, 13th edition.

Career Opportunities in Carpentry:

Entry-Level Occupations

Apprentice Carpenter	Assembler
Bench Worker	Framer
Installer	Millworker
Roofer	Sider

With Experience and /or Advanced Training

Carpenter/Cabinetmaker	Finish Contractor
Framing Contractor	General Contractor
Inspector	Remodeler
Supervisor/Foreman	Teacher

Related Occupations

Building Inspector	Mill Supervisor
Estimator	Home Inspector

Computer Aided Drafting & Design

Computer Aided Drafting & Design Exploratory
This course will give the student a chance to learn how to use CADD (Computer Aided Drafting and Design), one of the most powerful tools used by engineers and designers today. The students are encouraged to express their creative ideas with numerous challenging design projects. These design projects include creating a 3D model and printing them on a 3D printer to take home. A number of projects are aimed to assist students in learning about possible design engineering career paths. This is a very stimulating course where the only limit to the creativity and design possibilities is the students' willingness to think outside the box.

Computer Aided Drafting & Design Shop 1
Computer Aided Drafting & Design Shop 1 expands on the basics of design introduced in exploratory. Students will actively participate in practical design projects that will focus on research and development, prototyping, and the manufacturing process. Students will begin to learn about multiple 3D CADD software programs to prepare for advanced training in college or a career.

Computer Aided Drafting & Design Technology Shop 2 – PLTW (Project Lead The Way) Introduction to Engineering Design
This course will provide CADD and Engineering Technology students with the basic skills for both disciplines. The focus will be on CADD design and the principles of simple machines, heat loss from structures, fluid mechanics, basic electronics, and robotics. Students will use the Introduction to Engineering Design curriculum from Project Lead The Way (PLTW). Students will focus on the process of design and engineering problem-solving. Instructors will work closely with both Engineering Technology and CADD to provide support for the various projects that students will be constructing while they learn about computer-aided design Theory, practice, and build skills using Auto Desk Inventor, Revit, Solid Works, and other design software. Students will use the formal design process as they solve and build the solutions to real-world problems as well as work on reverse engineering products to make them smaller, cleaner, stronger, and smarter. Some projects include siege engines, wind turbines, Vex BattleBots, submarines, and the pencil dispenser challenge. In addition, this course includes a project-based curriculum where the formal design process will be used to solve the problems related to the projects students are working on. Students will work on employability skills that will prepare them for possible cooperative education placement and employment after graduation. This course can lead to college credit.

Computer Aided Drafting & Design Technology Advanced Shop 3 and 4
This course is based on an eight-term duration and provides in-depth training in the fields of architecture, interior design, mechanical engineering, industrial design along with the emerging industries related to movie and game design. The architectural segment covers a thorough look into the design and configuration of building trades incorporated within residential house construction. Students gain the skills required in room and space planning, interior elevations, roof plans, wall sections, and detail permit process. In the interior design segment, students will learn how to properly measure and document a space landscape development design, and civil engineering concepts such as bridge design, ground contours, and surveying. The mechanical segment introduces students to various Shop processes and focuses on reinforcing the students' skills in mechanical

drawing and design. This segment introduces them to the engineering design process. Students gain knowledge of threads and fasteners, gears, and pattern developments along with other current industry-related skills. Students will continue to develop their CADD skills throughout the year using the latest 2D and 3D CADD software while utilizing the rapid prototype machines (3D printing) and further developing their model-making skills. Students are taught the use of various measuring instruments including micrometers and Vernier calipers. Students are required to design, draw, engineer, and present a complete set of working drawings for a residential house and to design, draw, engineer, and present a mechanical project of their choosing. Assistance is provided to help students determine career or college choices after graduation.

Computer Aided Drafting & Design Technology Theory 3 & Theory 4
This course will introduce advanced concepts in architecture, 3D animation & gaming, and design and engineering career paths. We will expand on architectural and mechanical design in terms one and two. This will include reverse-engineering of parts, sheet metal design, general design and drafting Theory, and other advanced concepts needed to succeed in college or a career. The student will work on employability skills throughout the year in preparation for cooperative education, college, and job opportunities. At the end of semester one, the student will have a resume, portfolio, and references that they will use to secure employment. Seniors will take part in a year-long project of their own choice. Students can choose an architectural, 3D animation & gaming, or mechanical project. This project will be instructed and graded as if they were in the workplace.

UMASS Commonwealth Collegiate Academy

Commonwealth Collegiate Academy (Engineering Pathway)
The Commonwealth Collegiate Academy (CCA) of the University of Massachusetts is designed to increase early college opportunities for high school juniors and seniors in partner schools, with a special emphasis on the matriculation of ethnically diverse, first-generation, economically disadvantaged, and under-served students. The CCA early college partnership will provide enrolled students with increased academic rigor, challenge, and an intensive introduction to university-level work to support a smoother transition into higher education. Students will have the opportunity to earn university credits while at the same time satisfying high school graduation requirements, spend time on a University of Massachusetts campus to engage in college awareness activities and learn more about career options and college majors.

Participation in CCA courses is offered to students upon grade-level attainment and teacher recommendation. The courses offered are intended to support students within the pathway by accelerating the meeting of UMass Lowell Bachelor of Education degree requirements. More information can be found at:
https://cca.massachusetts.edu/

Please review Commonwealth Collegiate Academy (Engineering Pathway) section of the Program of Studies.

Career Opportunities in Computer Aided Drafting & Design:

Entry-Level Occupations

CADD Drafter I
Computer Aided Design Drafter
Architectural Drafter I
Drafter I
CADD Drafter
Architectural Drafter
Mechanical Drafter I
Level I Drafter

With Experience and/or Advanced Training

Industrial Architect
Mechanical Design Engineer
Automotive Design Engineer
Architectural CADD Teacher
Pipe Line Engineer
CADD Operator
CADD Manager
Survey Manager
Estimator
Residential Architect
Industrial Design Engineer
Engineering CADD Teacher
Electrical Designer
Structure Design Engineer
Process Engineer
Project Engineer
Oil & Gas Election Engineer

Related Occupations

Architects
Electrical & Electronic Engineering Technicians
Electrical & Electronics Installers & Repairers
Industrial Designers
Mechanical Engineering Technicians
Surveying & Mapping Technicians
Cartographers & Photogrammetrists
Electrical & Electronics Engineers
Electro-Mechanical Technicians
Landscape Architects
Mechanical Engineers
Surveyors

Cosmetology

Cosmetology Exploratory
The Cosmetology Exploratory program is designed to expose students to basic techniques and related activities pertaining to the cosmetology profession. Students will learn the importance of safety, sanitation, and personal hygiene. They will also participate in basic mannequin work and basic procedures in braiding, shampooing, blow drying, and nail art. Students are made aware of the 1,000 mandated hours required by the State Board of Cosmetology.

Cosmetology Shop 1
The Cosmetology Shop 1 program expands upon the basics which students were exposed to in exploratory in addition to basic facial cleansing, iron work, and basic nail care. Students will be taught correct techniques for safety and sanitation. They will be assessed for ability in their required competencies as well as interest and effort. We will also review the school's expectations throughout the course as well as the State Board required regulations. Students will explore the many job opportunities in the cosmetology field.

Cosmetology Shop 2
This program begins the students' first year of a three-year journey through cosmetology. Students can start to acquire their 1000 hours mandated by the State Board of Cosmetology for licensure only after they turn fifteen years old. Students are required to purchase a uniform and starter kit which contains the necessary supplies to introduce them to the foundational techniques of various hair styling methods, perm winding, basic haircutting, and state board techniques of facials, makeup, scalp treatments, facial waxing, and manicures. Projects are developed to reinforce the curriculum addressing different learning styles. In addition, students will study the Theory portion of cosmetology beginning with the introductory chapters of the New Milady Standards of Cosmetology.

Cosmetology Shop 3
This is the second year of the three (3) year state-regulated course. Students will continue to earn hours towards the state requirements. Students will review the basics that are learned in Cosmetology Shop 2, and then develop them into more advanced competencies necessary to meet industry demanded standards. Units introduced and developed include fundamental haircutting, various hairstyling techniques, chemical texture services, artificial nails, eyelash extensions, and a variety of hair color applications. Students will prepare and earn their certification in OSHA 10-hour General Industry for Cosmetology. Students will also be introduced to the curriculum regarding resume development.

Cosmetology Career Pathways 1
Career pathways will begin with an introduction to salon readiness by incorporating nail care, product knowledge, advanced make-up techniques including special effects makeup, and formal makeup application. Advanced nail care instruction will include current industry trends and techniques such as acrylic, dips and gel applications, nail art, and appliques. Students will acquire skills to work in the clinical environment while developing a professional image and a positive work ethic. The curriculum will also expose students to real-life expectations through role play of an interview process and job searching using multiple resources.

Cosmetology Theory 3
Students in Cosmetology Theory 3 will continue to accumulate required state board hours. During this year students will develop the ability to analyze the theoretical part of cosmetology by demonstrating an understanding of disinfectants, skincare, hair color, nail care, artificial hair enhancements, and professional styling products. Juniors will continue to use the online software program that includes tests, reviews, and comprehensive reports of their chapter progress. This electronic evaluation is a crucial resource in the student's preparation for the licensing exam. This program can also be accessed on their home computers.

Cosmetology Shop 4
This is the third year of the three (3) year program. The mandatory 1,000 hours should be completed during this time. Cosmetology Shop 4 is conducted similar to an actual salon environment, whereas students perform various cosmetology services on actual clients. Students will be able to apply for state licensure upon successful completion of the program. Students participate in advanced color skin care, hair cutting techniques, and simulated salon/industry scenarios. Students will also create a continuous online portfolio to showcase their skills obtained throughout their Cosmetology Program experiences.

Cosmetology Career Pathways 2
Students will continue with progressive instruction in Career Pathways including most techniques that were introduced in Cosmetology Shop 3 with advanced training in Lash Extension, Lifts and Tints. This level will also include advanced training in Bridal makeup application, advanced nail care, artificial hair enhancements, and coloring techniques. Students will practice activities that enhance employability skills to prepare them for Cooperative Education and employment upon graduation.

Cosmetology Theory 4
Cosmetology Theory 4 continues to cover all aspects of cosmetology including advanced styling, hair coloring, chemical texture services, anatomy, histology, job interviews, and salon management. Upon completion of the mandated 1000 hours, students will file an application to take the required State Board Examination. Students who pass this exam will receive their cosmetology license which will enable them to work in the hair, skin, and nail industry.

Career Opportunities in Cosmetology:

Entry-Level Occupations

Salon Operator
Receptionist
Salon Assistant
Product Sales
Nail Technician
Aesthetician
Waxing Technician

With Experience and/or Advanced Training

Med. Spa Technician
Product Demonstrator
Salon Manager
Color Technician
Make-up Artist for Theater
State Board Inspector

Cosmetology Instructor
Las Extension Specialist
Artificial Hair Technician
Microblading Technician

Culinary Arts

Culinary Arts Exploratory
In this introductory culinary class, students will be introduced to cooking and academic techniques that are currently used in the culinary industry. A wide variety of industry tools and equipment will be used throughout the course. Each student will have the opportunity to produce up to three projects from scratch. Each project will focus on developing a particular skill. Upon completing each project, students will be given the opportunity to taste the items produced and compare their projects to their peers as well as self-evaluate using rubrics provided.

Culinary Arts Shop 1
In the first part of the Culinary Arts program, students will focus on food safety, personal hygiene, preventing cross-contamination, controlling time and temperature, and cleaning and sanitizing. Students will be given the opportunity to earn their Food Handler certification. This certification is the foundation for safe food handling and is the first step to earning the ServSafe Manager certification. Students will be prepared for Culinary Arts Shop 2, 3, and 4 by learning the expectations for uniforms that will be used throughout all levels.

Culinary Arts Shop 2
The first full year of the three-year program introduces students to industry standards in uniform and personal hygiene, provides instruction in the areas of terminology, stocks and soups, sauces, salads, vegetable production, and introductory knife skills. Students are introduced to the principles of kitchen production and recipe conversions. Students are also assigned to the Artisan Restaurant where they will participate in a variety of restaurant and banquet tasks from serving to cash register operation and cash handling, to managing the restaurant operations and banquet floor.

Culinary Arts Shop 3
The second full year of the Culinary Arts program functions as the in-house caterer with students working in various catering positions using cooking techniques such as sautéing and roasting. There is an introduction to basic baking techniques such as lean doughs, laminated doughs, and plated desserts. There is an introduction to garde manger, a continuation of salad preparation, and simple decorating techniques. During this year students will receive their OSHA 10-hour general industry card.

Culinary Arts Theory 3
This course affords students the opportunity to develop a strong foundation in the foodservice industry. Students will be trained in safety and sanitation. ServSafe, a nationally recognized program, is offered so that students have the opportunity to obtain a five-year certificate in sanitation that is accepted everywhere in the country and could potentially earn them college credit. Food safety has never been more important to the restaurant industry and its customers. Based on the *2013 FDA Food Code,* the *ServSafe Manager Book, 7/e* focuses on preventative measures to keep food safe. To better reflect the changing needs of a diverse and expanding workforce, food safety topics are presented in a user-friendly, practical way with real-world stories to help students understand the day-to-day importance of food safety. The streamlined delivery of food safety content will create a learning experience that is activity-based and easily comprehended by a variety of learners. The end result is content that is more focused, leading to stronger food safety practices and a better-trained workforce.

Culinary Arts Shop 4
In the third full year of this three-year program, senior students will run and operate a high production kitchen that services the Artisan Restaurant which is open to the public. High-level hands-on training will ensure that the students are prepared to build a career within the culinary field. In addition to cooperative education opportunities, the final year of this program involves the student with meat cookery, recipe conversion, cost analysis, and menu planning, managing food supplies, and kitchen resources.

Culinary Arts Theory 4
During the first two terms, this course affords the opportunity to develop a strong foundation in the mathematical side of the food service industry as well as the opportunity to explore the idea of entrepreneurship. Students will create a working business plan for a food service establishment. The business plan will include but is not limited to, marketing concepts, recipe cost analysis, and floor plan design. For the third and fourth terms, students will be introduced to the science of baking and nutrition. Students will learn the functions of ingredients used in baking and will also look into alternatives for these ingredients that will meet a variety of dietary restrictions.

Culinary Arts Cafe Shop 2
The first full year of the three-year program provides instruction in the areas of terminology, soups, sauces, sandwiches, salads, vegetable production, garnishing, and introductory knife skills. Students are introduced to principles of production and recipe conversions with a strong emphasis on food safety, sanitation, and employability skills. Students will also be trained in an industry-standard laundry facility. Students will be assigned to participate in a variety of restaurant stations including service, host, and managing in a busy cafe setting that serves the public.

Culinary Arts Cafe Shop 2 Theory
This course affords the opportunity to develop a strong foundation in the foodservice industry. Students will be trained in safety and sanitation. ServSafe, a nationally recognized program, is offered so that students have the opportunity to obtain a Food Handlers /certification. Food safety has never been more important to the restaurant industry and its customers. Obtaining this certification will provide the student with increased employment opportunities. To better reflect the changing needs of a diverse and expanding workforce, food safety topics are presented in a user-friendly, practical way with real-world stories to help students understand the day-to-day importance of food safety. The streamlined delivery of food safety content will create a learning experience that is activity-based and easily comprehended by a variety of learners. The end result is content that is more focused, leading to stronger food safety practices and a better-trained workforce.

Career Opportunities in Culinary Arts:

Entry-Level

Server
Dish and Pot Washer
Prep Cook
Cake Decorator
Banquet Server
Bus Person
Apprentice Baker

With Experience

Sous Chef
Food and Beverage Manager
Executive Chef
Restaurant Manager
Pastry Chef

Related Occupations

Entrepreneur
Food Photographer
Culinary Arts Teacher
Industry Sales Representative
Research and Development

Design & Visual Communications

Design & Visual Communications Exploratory

The Design and Visual Communications Exploratory presents a broad overview of the industry. Students explore their talents in design, sketching, computer illustration, and digital photo enhancement. Students will be introduced to the industry-standard software Adobe Design Suite. Employment opportunities in the area of Design & Visual Communications will be reviewed. This exciting curriculum takes a hands-on approach to completing several projects including creating a daily drawing, doing a job in the field-based project, and creating word art in Adobe Illustrator. Students are encouraged to express themselves creatively.

Design & Visual Communications Shop 1

The Design and Visual Communications Shop 1 experience provides the student with a more in-depth curriculum and takes a hands-on approach to complete a variety of projects in the Shop setting. Students will be given the opportunity to further their skills using the industry-standard software Adobe Design Premium Suite. Through project-based learning, the students will have the opportunity to learn the basics of PhotoShop, Illustrator, and Dreamweaver. The students will also practice foundation skills, such as drawing, painting, and composition.

Design & Visual Communications Shop 2

The scope of the curriculum revolves around a heavy foundation of fundamentals in design concepts, software, and equipment. This course studies a large portion of the Adobe Suite software such as PhotoShop, Illustrator, and InDesign. Fundamentals of design, such as the principles, elements, and color Theory are practiced through class assignments and projects. The development of employability skills is integrated into the curriculum where students will participate in group projects, art critiques, project deadlines, and presentations. This course provides a range of studies that include: typography, layout design, mixed media, digital design, and photography. The varied curriculum is preparation for students to guide them in their own interests and acquire skills for future applications within Design and Visual, for college and industry.

AP 2-D Art and Design – Advanced Placement

AP 2-D Art and Design is an introductory college-level course where students refine and apply skills and ideas they develop throughout the course to produce a two-dimensional art and design portfolio of 20 images with supporting writing. This Advanced Placement course suits those who are serious about furthering their own art and design experience, focusing on the investigation of materials, processes, and the making/presenting of art and design. Students should consider how materials, processes, and ideas can be used to make work that supports a sustained investigation topic. Students can work with any medium and process they feel supports their investigation. Graphic design, digital imaging, photography, collage, fabric design, weaving, fashion design, illustration, and printmaking are among the possibilities for submission in their portfolio.

Design & Visual Communications Shop 3

In Design and Visual Communications Shop 3, students will begin preparing a portfolio of work that will be used for college and career readiness. There will be an emphasis on creative concept development, advertising and promotional design, observational drawing, illustration, and photography. Students will participate in several contests and competitions, in addition to completing client-based production. Students will engage in

presentations, creative prompts, and critiques. An emphasis will be placed on employability skills, including time management and work ethic. Students will learn about workplace safety in the related field.

Design & Visual Communications Theory 3
Students will learn web design skills using Adobe Dreamweaver. Each student will design a webpage based on their portfolio of work including computer graphics, illustrations, printing projects, awards, and certificates. Students will also focus on creating a professional resume and job search skills. Students will practice interview skills through mock interviews and will focus on their employability skills. Students will research job opportunities in their chosen area of Design and Visual Communications and will explore realistic budgeting based on current salaries from the government-published Job Outlook Handbook. Students will also obtain the OSHA 10 Hour certification.

Design & Visual Communications Shop 4
In Design and Visual Communications Shop 4, students will continue preparing a portfolio of work that will be used for college and career readiness. Students will continue to build technical skills learned in DVC Shop 3, including presentations, creative prompts, and critiques. An emphasis will be placed on employability skills, including time management and work ethic. Students will continue to learn about workplace safety in the related field. Both a printed portfolio book and a digital portfolio will be created to assist in obtaining employment. Students will present a portfolio of work to both college representatives and industry professionals for critique. Students will be encouraged to participate in cooperative education.

Design & Visual Communications Theory 4
Students will learn Adobe Animate. Students will create their own animations through the process of creating characters, writing a story, and creating a storyboard. Students will also focus on videography. Students will write scripts, plan, and video a project. Students will also focus on team-building skills and career prep and will continue to work on employability skills.

Career Opportunities in Design & Visual Communications:

Entry-Level Occupations

Production Artist
Calligrapher
Airbrush Artist
Fine Artist
Graphic Designer
Photographer
Pre-Press Designer
Illustrator
Production Artist
Layout Artist

With Experience and/or Advanced Training

Animator
Visual Arts Teacher
Cartoon Artist
Technical Artist
Tattoo Artist
Layout Person
Art Director
Digital Media Instructor
Concept Artist
Scenic Artist
Medical Illustrator
Film/Video Editor

Camera Operator
Art Director
User Interface Designer

Related Occupations

User Experience Designer
Fashion Designer
Game Designer
Museum Curator/Director
Social Medial Marketing
Copywriter
Interior Designer
Advertising
Film/Television Producer
Production Manager

Early Childhood Education

Early Childhood Education Exploratory
This course is designed to introduce the student to the many career paths involved with working with young children. Early Childhood Education refers to teaching children from birth to age nine and can lead to a career as a preschool teacher, child care provider, nanny, au pair, paraprofessional, recreation worker and much more. Students will participate in a variety of hands-on activities for preschool education using art, music, math, science and children's literature. Professional behavior, supervision, safety and the ability to lead and facilitate a classroom of young children will be stressed.

Early Childhood Education Shop 1
This course is an introduction to the duties and responsibilities of becoming a teaching assistant in our on-campus preschool. Through project-based learning activities, Shop students learn to create their first lesson plans for preschool. At the end of this course, students will take home a beginner portfolio of lesson plans and products they created. Professional behavior, supervision and safety of children and the ability to lead and facilitate a classroom of young children will be stressed.

Early Childhood Education Shop 2
Students begin their exploration of the teaching profession throughout ECE Shop 2. Students will be introduced to and guided through the seven components of the Responsive Classroom teaching style during this year of Shop. Students will conduct lessons and activities through the use of simulation and role play. Sophomore students spend part of their school day working in the Little Gryphons Preschool directly with the preschool students. Throughout this course, students will study foundational concepts about the education profession and learn about curriculum, classroom management, accommodating student specific needs and learning theorists. Students will dive into topics such as child development, teacher language and safety procedures for children. Students will research and discuss different educational settings and career opportunities working with children.

Sophomore students obtain pediatric and adult CPR & First Aid training and certification. Sophomore students also obtain OSHA certification.

Early Childhood Education Shop 3
Students in ECE Shop 3 gain practical experience in our on-site preschool center, serving twenty 3, 4, & 5-year-old children. High school students begin their training as teacher aides in the preschool classroom. Students plan and implement developmentally appropriate preschool lessons for all learning centers using a thematic approach. Students perform routine duties, supervise and evaluate activities, and conduct formal observations and assessments. Students gradually assume the role of a teacher in the preschool classroom and add the responsibilities of conducting morning meetings, and music & movement activities to their daily routines. Each student also further develops their employability skills such as appropriate attendance, punctuality, professionalism, communication, and leadership skills.

Early Childhood Education Theory 3
This is one of two child development courses required for EEC certification. This course explores major aspects of child development. Students will examine current theories of learning associated with early childhood,

adolescent, and adult growth and development. Topics will include child guidance, health and safety, family and culture, special needs and how to create developmentally appropriate learning environments for children.

In addition to learning about safety and supervision of children, students will participate in OSHA training to earn their *10-hour OSHA card in General Industry*.

This course will focus on college and career readiness. Students will develop employability skills such as professional behavior, communication skills, time management, teamwork and interviewing strategies for employment in the Early Childhood field, as well as, acceptance into college programs.

Early Childhood Education Shop 4
Upon completion of ECE Shop 2 & 3, as well as Theory course requirements, students in ECE Shop 4 have the opportunity to begin working in an early childhood classroom through our cooperative education program. ECE Shop 4 focuses on refining the practices and techniques learned in previous years. Students are given the opportunity to master skills such as appropriate discipline & guidance, curriculum development, and fostering self-control in children. Students must document their own growth as teachers and begin to develop personal teaching philosophies and portfolios. Hands-on, individualized training continues to play an integral role in the complete learning process.

Early Childhood Education Theory 4
This is one of two child development courses required for EEC certification. This course continues to explore major aspects of child development. This course will introduce students to different philosophies and program models of early childhood education such as Montessori, Waldorf, Reggio Emilia and more. Students will research and evaluate different program models in private and public settings. More time will be devoted to the development of personal teaching styles, classroom management strategies and how to create a developmentally appropriate curriculum. Students will formulate a personal philosophy of education, as well as a professional portfolio. Other topics in this course will include the areas of Special Education, Child Abuse & Neglect, School and the Law, Lesson Planning and Child Health and Wellness.

This course will continue to focus on college and career readiness. Students will refine their employability skills and prepare for obtaining employment and/or acceptance into a college program.

Upon successful completion of the program, students may apply for their *EEC certification* from the *Massachusetts Department of Early Education and Care.*

UMASS Commonwealth Collegiate Academy

Commonwealth Collegiate Academy (Education Pathway)
The Commonwealth Collegiate Academy (CCA) of the University of Massachusetts is designed to increase early college opportunities for high school juniors and seniors in partner schools, with a special emphasis on the matriculation of ethnically diverse, first-generation, economically disadvantaged, and under-served students. The CCA early college partnership will provide enrolled students with increased academic rigor, challenge, and an intensive introduction to university-level work to support a smoother transition into higher education. Students

will have the opportunity to earn university credits while at the same time satisfying high school graduation requirements, spend time on a University of Massachusetts campus to engage in college awareness activities and learn more about career options and college majors.

Participation in CCA courses is offered to students upon grade-level attainment and teacher recommendation. The courses offered are intended to support students within the pathway by accelerating the meeting of UMass Lowell business/marketing-related degree requirements. More information can be found at: https://cca.massachusetts.edu/

EDUC.1600 Technology and Digital Literacy in the Classroom – Early College
https://www.uml.edu/catalog/courses/educ/1600
This course allows students to explore the wide-range of educational technologies, including technology for teaching, as well as technology of learning. Students will explore educational technology standards for teaching and learning, have a chance to try out many types of technologies, and see how these technologies are being used in classroom.

EDUC.2100 Introduction to Moderate Disabilities – Early College
https://www.uml.edu/catalog/courses/educ/2100
This foundational course consists of two major components. The first provides candidates with a comprehensive examination of special education laws and legislation and the characteristics of students with moderate disabilities. The second component provides and overview of instructional models that have empirical support for their effectiveness in teaching students with moderate disabilities. Candidates also gain exposure to IEP writing and lesson planning.

Career Opportunities in Early Childhood Education:

Entry-Level Occupations

- Infant/Toddler Assistant Teacher or Teacher
- Aide in Public Schools
- Day Care Center Aide
- Paraprofessional
- Camp Counselor
- Preschool Assistant Teacher or Teacher
- Before/After School Care
- ABA Tutor
- Recreational Worker
- Nanny

With Experience and a College Degree

- Public/Private School Teacher Grades Preschool -12
- Special Education Teacher
- Social Worker
- Board Certified Behavior Analysist
- Speech and Language Pathologist
- Occupational Therapist
- Family Counselor
- ELL/ESL Teacher
- School/Guidance Counselor
- Expressive Arts Therapist
- Librarian
- Early Intervention Specialist
- Child Life Specialist

Electrical

Electrical Exploratory
In the classroom, the student will be introduced to the many different career opportunities in the electrical field. The main focus of the student will be to learn what an apprentice electrician is and what is required to become a journeyman electrician. We will discuss what good employability skills are and finish up with basic Shop safety practices and basic hand tools and their uses. Shop projects include basic schematic and wiring diagrams, splicing of conductors, and installing buzzers and doorbell chimes. At the conclusion of the exploratory program, the student will leave with a basic understanding of what is required to become a successful journeyman electrician.

Electrical Shop 1
This course provides students with the fundamentals of wiring methods. Using basic hand tools, students demonstrate the skills required for low voltage. Students will wire projects using basic wiring methods including bell wire. Students will learn to install doorbell buzzers and chimes, single pole switches, 3-way and 4-way switches, light sockets, and duplex receptacles. Students learn how to draw and follow a wiring diagram. Electrical and hand tool safety is an integral part of the course.

Electrical Shop 2
This course was carefully designed to prepare students with the basic fundamental skills necessary to continue on a path to a successful electrical career. The student's electrical career will start with an understanding of A/C electrical circuits and Shop safety policies such as current OSHA regulations which cover electrical safety, ladder safety, tool safety, and personal protective equipment to name a few which are essential for a safe working environment.

While working on assigned Shop projects, the students will demonstrate a firm understanding of properly using hand tools and installing basic wiring methods. (Such as non-metallic sheathed cable, M/C cable, EMT, surface metal raceway, and PVC.) It is also important to introduce print reading skills using standard electrical symbols and to determine the scale used on a typical single-family floor plan. Using a standard ruler, an electrical student will record the room sizes and determine the required outlets according to the NEC.

All students will maintain a three-ring binder that will be organized with all of their work which will include Shop projects, wiring diagrams, and a complete materials list required to assemble the projects.

Electrical Shop 3
This course is a continuation of Electrical Shop 2. Emphasis is placed on proper wiring techniques and the National Electrical Code. Hands-on wiring of single-phase installations which are used in residential and commercial establishments is covered in this course. Wiring methods will include non-metallic sheathed cable, metal clad cable, electrical metallic tubing, surface metal raceway, and rigid non-metallic conduit. This course also offers conduit bending techniques using a PVC heater box and heating blanket, hydraulic benders, and more complex hand bending. Students also deal with lighting, electric heat, and electrical maintenance; this includes 100- and 200-amp residential services, lighting circuits, time clocks, and new building construction. Students

will also be involved with an on-site house-building program. The Electrical Shop 3 students will be eligible for cooperative education after completion of the 2nd quarter. During this year, students will prepare to enter the workforce through resume writing and weekly job site safety talks. Students at this level are eligible for cooperative education which is highly encouraged.

Electrical Theory 3
The Electrical Theory 3 program includes the science, electrical code, and drawing information related to the successful completion of Shop projects for Electrical Shop 3. The students will become knowledgeable in the areas of the function of specific pieces of equipment, electrical code interpretations for general and specific wiring methods, and how to prepare and understand the drawings used in the residential installations.

Electrical Shop 4
This course is a continuation of Electrical Shop 3. Emphasis is placed on proper wiring techniques and the National Electrical Code. Electrical Shop 4 concentrates on real-world work experience; as we work on projects around the school building and out-of-district on volunteer jobs. Wiring methods will include non-metallic sheathed cable, metal-clad cable, electrical metallic tubing, rigid metal conduit, and rigid nonmetallic conduit as well as CAT 6 wiring through the Information Services Department. This course offers senior students an opportunity to have the feel of a working Shop environment while still in a school setting. We will use specific jobs such as Habitat for Humanity and other volunteer opportunities to assign specific tasks in the electrical trade to students to be completed in a timely manner. Students will practice and perform actual wiring in a residential dwelling unit. We also continue to explore other aspects of the trade such as control wiring. During this year we are also continuing to prepare students to enter the workforce through resume writing and weekly job site safety talks. Students at this level are eligible for cooperative education which is highly encouraged.

Electrical Theory 4
This course includes the science, electrical code, and drawing information related to the successful completion of projects in Electrical Shop 4. The student will become knowledgeable in the areas of the function of specific pieces of equipment, Electrical Code interpretations for general and specific wiring methods, and how to prepare and understand drawings used in industrial and commercial installations.

Career Opportunities in Electrical:

Entry-Level Occupations

Electrical Apprentice	Electrical Supply Company Worker
Electrician's Helper	Solar Energy Installation

With Experience and/or Advanced Training

Business Agent for Electrician Union	Electrical Advisory Committee
Electrical Contractor	Electrical Instructor
Journeyman Electrician	Master Electrician
Teacher	Wiring Inspector

Related Occupations

Alarm Installer
Electrical Cost Estimator
Power Company Lineman
Power Plant Operator
Service Representative

Electronics Engineering

Electronics Exploratory
In this course, the student is exposed to a range of career opportunities in the electronics field. The student is introduced to basic electronics and computer science concepts, electromechanical assembly, hand tools, test meters, and microcontrollers used in the industry and most aspects of modern life. The student learns basic soldering techniques, solders and desolders components on circuit boards, builds an electronic operating circuit, and receives hands-on experience with standard electronic tools and basic robotics.

Electronics Engineering Shop 1
The Electronics Engineering Shop 1 student is exposed to a structured, introductory electronics curriculum. The student will be re-introduced to electronic terminology, component identification, and circuitry. The student will build a simple electronic project using standard electronic components and hand tools. The student will be introduced to computer system concepts, fundamental computer hardware, and computer-controlled circuitry. Using a microcontroller, they will experience the effect of programming code on various sensors and motors.

Electronics Engineering Shop 2 - Analog Electronics
Electronics Engineering Shop 2 is a foundation course designed to prepare the student for further study in the electronics engineering and technology fields. The student will demonstrate health and safety practices, learn the use of measurement devices, assemble electronic circuits, use electronic hand tools and equipment, select and use DC and AC instruments, and apply electronics theory to the engineering design process. The student will select the use of discrete semiconductor instruments, apply electronic principles, perform calculations and apply electronic principles of semiconductor circuits. Students continue with the study of analog electronics with an introduction to advanced semiconductor operation. Construction projects and labs will supplement all instruction. Labs will be constructed with hands-on trainers and breadboards as well as the use of the Multisim software program. Throughout the course, the students will demonstrate and develop language arts and communication skills, apply mathematical strategies to solve problems, apply science and engineering technology strategies (STEM), solve problems using critical thinking, demonstrate positive work behaviors, and demonstrate the ability to use technology for research, problem-solving, and communication. Students are introduced to basic electricity and electron Theory, basic DC Theory, and circuitry, involving Ohm's Law, Watts Law, circuit components, multiple load circuits, meter construction and reading, basic AC circuits involving magnetism, electromagnetism, capacitance, inductance, transformers, and RC and L circuits. Also covered are semiconductors, diodes, transistors, and power supplies. The student will also utilize computer-aided instruction (CAI) as a supplement to the classroom and textbook material. Students will receive an introduction to computer hardware and computer operating systems. All Theory-based instruction will be verified using hands-on experiments in the Shop.

Electronics Engineering Shop 3 - Digital Electronics
This is a continuation of the Electronics Engineering Shop 2 and is focused on analog electronics to prepare the student for further study in the engineering and technology fields. The student will demonstrate health and safety practices, demonstrate and apply the design process, problem-solving, diagnostic skills, and troubleshooting to digital devices. The student will use measurement devices, assemble digital electronic circuits, use electronic hand

tools and equipment, and digital instruments. The student will apply electronic principles of digital circuits to their projects, perform calculations, and verify digital devices using combinational logic. The student continues more advanced digital circuits using sequential logic. In this phase, students analyze flip-flops, shift registers, asynchronous up/down counters, synchronous up/down counters, and D/A converters. Students will also design and build a digital clock on their trainers using computer software for the schematic drawings. This part of the course introduces the student to the Theory and design of personal computers. Students will also demonstrate an understanding of the microcontroller's characteristics and applications using Parallax "What's A Microcontroller?" PIC microcontroller robots. The use of hands-on Dynalogic boards and Multisim software will aid in the understanding of digital. Throughout the course, the student will demonstrate language arts and communication skills, apply mathematical strategies to solve problems (STEM), communicate in multiple modes to address needs within the career and technical field, solve problems using critical thinking, demonstrate positive work behaviors, and demonstrate the ability to use technology for research, problem-solving, and communication.

Electronics Engineering Theory 3 - Electronics Technician Associate Level 1 Electronics Engineering Theory 3 is intended for electronics technician students, who are seeking the status of Certified Electronics Technician, Associate Level (CETa). It prepares students to become Journeyman (GET), Senior (CETsr), or Master (CETma) CETs. Topics range from electronic components and semiconductors, AC and DC circuits, analog circuits, RF, cabling, and telecommunications. The students become better technicians with a solid core of basic electronics knowledge. Course materials include The Associate CET Study Guide and Introduction to Electronics.
ETA International represents a wide variety of professionals from many industries, including avionics, biomedical, data cabling, fiber optics, gaming & vending, industrial electronics, information technology, renewable energy, smart home, and wireless communications. ETA also offers FCC Commercial Radio Operator licensing. Employers worldwide choose ETA-certified professionals because of ETA's certification programs' competency criteria and testing benchmarks that conform to the highest international electronics standards

Electronics Engineering Shop 4
Electronics Engineering Shop 4 is designed to prepare the student to take the "Student Electronic Test" (SET) certification given by Electronics Technician Association International (ETA). This is a nationally recognized organization that has developed a basic set of knowledge standards and competencies for the electronic industry. This organization has major input and influence on the Massachusetts frameworks for electronics. The program covers 22 chapters including DC electronics, AC electronics, components and semiconductors, analog circuits, cabling & telecommunications, digital circuits, microprocessors, troubleshooting, repair, test equipment, and service management.
Students will be instructed on the practical aspects of constructing a computer. This includes preparing the motherboard by installing the CPU, CPU fan, and memory DIMM. Installing the power supply, video card, NIC card, sound card, audio card, and peripherals are also taught. Installing the operating system and testing the functionality of the computer after it is built. Students will also be instructed on how to set up a small network, hope to share printers, files, and other resources in a server-client environment.

Electronics Engineering Theory 4 - Electronics Technician Associate Level 2
Topics in Electronics Engineering Theory 4 range from microprocessors, transmitters, and essential skills every Certified Electronics Technician needs such as record keeping and technical writing. Each chapter is followed by a practice quiz and the entire guide is covered in a final practice examination, which will further prepare an

individual for the CETa examination. ETA-certified professionals work for some of the most widely-known companies, including Bellsouth, ADT Security, American Airlines, AutoZone, Boeing, Budweiser, Canon, Caterpillar, Ford Motor Company, Google, Home Depot, Kmart, Lockheed Martin, Motorola, Quest Communications, Raytheon, State Farm, TD Ameritrade, Verizon Communications and more!

CISCO Networking Academy CCNA Discovery covers general networking Theory and the basics of routing, switching, and advanced technologies within the context of environment for home and small office networks. The Cisco Networking Academy Program is a comprehensive e-learning program that provides students with the internet technology skills essential in a global economy. The Networking Academy delivers web-based content, online assessment, student performance tracking, hands-on labs, instructor training and support, and preparation for industry-standard certifications. The course is taught in two phases. The first phase teaches students the skills needed to obtain entry-level home network installer jobs. It provides a hands-on introduction to networking and the internet using tools and hardware commonly found in the home and small business environments. Labs include PC installation, internet connectivity, wireless connectivity, file and print sharing, and the installation of game consoles, scanners, and cameras. The second phase of the course helps the students develop some of the skills needed to become network technicians, computer technicians, cable installers, help desk technicians and provides a basic overview of routing and remote access, addressing, and security. It also familiarizes students with servers that provide e-mail services, webspace, and authenticated access. Students learn about the soft skills required for help desk and customer service positions, and the final chapter helps them prepare for the CCENT certification exam. Network monitoring and basic troubleshooting skills are taught in context.

Commonwealth Collegiate Academy (Engineering Pathway)

The Commonwealth Collegiate Academy (CCA) of the University of Massachusetts is designed to increase early college opportunities for high school juniors and seniors in partner schools, with a special emphasis on the matriculation of ethnically diverse, first-generation, economically disadvantaged, and under-served students. The CCA early college partnership will provide enrolled students with increased academic rigor, challenge, and an intensive introduction to university-level work to support a smoother transition into higher education. Students will have the opportunity to earn university credits while at the same time satisfying high school graduation requirements, spend time on a University of Massachusetts campus to engage in college awareness activities and learn more about career options and college majors.

Participation in CCA courses is offered to students upon grade-level attainment and teacher recommendation. The courses offered are intended to support students within the pathway by accelerating the meeting of UMass Lowell Bachelor of Education degree requirements. More information can be found at: https://cca.massachusetts.edu/

Please review Commonwealth Collegiate Academy (Engineering Pathway) section of the Program of Studies.

Career Opportunities in Electronics Engineering:

Entry-Level Occupations

CATV Technician
Electronic Stockperson
Bench Technician
Field Service Technician
Radio-Television Technician
Home & Small Business Networking Technician
Electromechanical Assembler Test Tech.
Computer Technician
Electronic Wirer and Assembler
Help Desk Technician
Photocopier Repairperson
Video Game Technician
Electronic Salesperson
Remote Service Tech.

With Experience and/or Advanced Training

Audio Visual Engineer
Electrical & Electronics Engineer
Electronics Instructor
Licensed Radio-Television Technician
Production Line Supervisor
Telecommunications Engineer
Electrical & Electronics Installers & Repairers
Electronic Equipment Fabricator
Computer Design Engineer
Electromechanical Inspector
Electrical & Engineering Assistant
Microwave Engineer
Satellite System Designer
Calibration Technician
Test Equipment Technician
Home Entertainment Technician

Related Occupations

Audio Visual Security Technician
Certified Network Associate
Electro-Optical Engineer
Network Security Specialist
Robotics Engineer
Automotive Electronics Technician
Medical Electronics Technician
Environmental Control Technician
Radar Engineer

Engineering Technology

Engineering Technology Exploratory
Students will explore various types of engineering. Students will develop and demonstrate foundational skills in problem-solving, diagnostics, and troubleshooting via application of the design process using measurement devices, sketching, and brainstorming independently and among teams. Students will be introduced to assembling and programming a robot, and design challenges.

Engineering Technology Shop 1
Students will continue to develop and demonstrate skills in problem-solving, diagnostics, and troubleshooting via the application of the design process. Students will use measurement devices to experience and explore the use and application of electronic components and devices. Students will create sketches for their design ideas as they identify mechanical components while developing and programming a robot. Students will continue to explore and define various types of engineering.

Engineering Technology Shop 2 – PLTW (Project Lead The Way) Introduction to Engineering Design
This course will provide CADD and Engineering Technology students with the basic skills for both disciplines. The focus will be on CADD design and the principles of simple machines, heat loss from structures, fluid mechanics, basic electronics, and robotics. Students will use the Introduction to Engineering Design curriculum from PLTW (Project Lead The Way). Students will focus on the process of design and engineering problem-solving. Instructors will work closely with both Engineering Technology and CADD to provide support for the various projects that students will be constructing while they learn about computer-aided design Theory, practice, and build skills using Auto Desk Inventor, Revit, Solid Works, and other design software. Students will use the formal design process as they solve and build the solutions to real-world problems as well as work on reverse engineering products to make them smaller, cleaner, stronger, and smarter. Some projects include siege engines, wind turbines, vex battle bots, submarines, and the pencil dispenser challenge. In addition, this course includes a project-based curriculum where the formal design process will be used to solve the problems related to the projects students are working on. Students will work on employability skills that will prepare them for possible cooperative education placement and employment after graduation. This course can lead to college credit.

Engineering Technology Shop 3 (Semester 1) PLTW (Project Lead The Way) Digital Electronics
This course from PLTW (Project Lead The Way) is the study of electronic circuits that are used to process and control digital signals. The focus of the course is to expose students to the process of combinational and sequential logic design, teamwork, communication methods, engineering, and technical standards, and documentation. Students will apply digital concepts to control systems and through programmable logic boards and robotic automation. This course can lead to college credit.

Engineering Technology Shop 3 (Semester 2) PLTW (Project Lead The Way) Computer Integrated Manufacturing
This course from PLTW (Project Lead The Way) is the study of modern manufacturing techniques that are used to produce complex objects as components in familiar products. Manufactured items are part of everyday life,

yet most students have not been introduced to the high-tech, innovative nature of modern manufacturing. This course illuminates the opportunities related to understanding manufacturing. At the same time, it teaches students about manufacturing processes, product design, robotics, and automation through coding, advanced simulation, and manufacturing equipment. Students can earn a virtual manufacturing badge recognized by the National Manufacturing Badge system. This course can lead to college credit.

Engineering Technology Theory 3 – PLTW (Project Lead The Way) Civil Engineering and Architecture
In Engineering Technology Theory 3 - Civil Engineering and Architecture students will study surveying basics and data collection related to surveying. The students will extend their work with the Autodesk Architectural CAD program to plot their survey points and design commercial building site features. The focus will be on civil engineering and different municipal systems and infrastructure. For example, electrical power distribution, drinking water distribution, drain collections, roads, and bridges. This will directly support the civil engineering projects that are a key part of the junior year engineering curriculum Shop class. In addition, students will work on real-world employability skills that will prepare them for possible co-op placement and employment after graduation. This course can lead to college credit.

Engineering Technology Shop 4 - PLTW (Project Lead The Way) Engineering Design and Development
Engineering Technology Shop 4 (Engineering Design and Development) is the capstone course in the PLTW high school engineering program. It is an open-ended engineering research course in which students work in teams to design and develop an original solution to a well-defined and justified open-ended problem by applying an engineering design process. Students will perform research to select, define, and justify a problem. After carefully defining the design requirements and creating multiple solution approaches, teams of students select an approach, create, and test their solution prototype. While progressing through the engineering design process, students will work closely with experts and will continually hone their organizational, communication and interpersonal skills, their creative and problem-solving abilities, and their understanding of the design process.

Engineering Technology Theory 4 – PLTW (Project Lead The Way) Principles of Engineering
Engineering Technology Theory 4 uses the Principles of Engineering curriculum from PLTW. This survey course exposes students to some of the major concepts that they will encounter in a postsecondary engineering course of study. Through problems that engage and challenge, students explore a broad range of engineering topics, including mechanisms, the strength of materials and structures, automation, and kinematics. The course applies and concurrently develops secondary level knowledge and skills in mathematics, science, and technology. Students have the opportunity to develop skills and understanding of course concepts through activity-, project-, and problem-based (APB) learning. By solving rigorous and relevant design problems using engineering and science concepts within a collaborative learning environment, APB learning challenges students to continually hone their interpersonal skills, creative abilities, and problem-solving skills. Students will also learn how to document their work and communicate their solutions to their peers and members of the professional community. It also allows students to develop strategies to enable and direct their own learning, which is the ultimate goal of education.

Commonwealth Collegiate Academy (Engineering Pathway)

The Commonwealth Collegiate Academy (CCA) of the University of Massachusetts is designed to increase early college opportunities for high school juniors and seniors in partner schools, with a special emphasis on the matriculation of ethnically diverse, first-generation, economically disadvantaged, and under-served students. The CCA early college partnership will provide enrolled students with increased academic rigor, challenge, and an intensive introduction to university-level work to support a smoother transition into higher education. Students will have the opportunity to earn university credits while at the same time satisfying high school graduation requirements, spend time on a University of Massachusetts campus to engage in college awareness activities and learn more about career options and college majors.

Participation in CCA courses is offered to students upon grade-level attainment and teacher recommendation. The courses offered are intended to support students within the pathway by accelerating the meeting of UMass Lowell Bachelor of Education degree requirements. More information can be found at: https://cca.massachusetts.edu/

Please review Commonwealth Collegiate Academy (Engineering Pathway) section of the Program of Studies.

Career Opportunities in Engineering Technology:

Entry-Level Occupations

CAD Drafter I
Computer Aided Design Drafter
Architectural Drafter I
Drafter I
Electrical & Electronic Engineering Technicians
Mechanical Engineering Technicians
CAD Drafter
Architectural Drafter
Mechanical Drafter I
Level I Drafter
Electro-Mechanical Technicians

With Experience and/or Advanced Training

Industrial Architect
Mechanical Design Engineer
Automotive Design Engineer
Architectural CAD Teacher
Pipe Line Engineer
CAD Operator
CAD Manager
Survey Manager
Estimator
Industrial Designers
Residential Architect
Industrial Design Engineer
Engineering CAD Teacher
Electrical Designer
Structure Design Engineer
Process Engineer
Project Engineer
Oil & Gas Election Engineer
Electrical & Electronics Engineers
Mechanical Engineers

Related Occupations

Architects	Cartographers & Photogrammetrists
Electrical & Electronic Engineering Technicians	Electrical & Electronics Engineers
Electrical & Electronics Installers & Repairers	Electro-mechanical Technicians
Industrial Designers	Landscape Architects
Mechanical Engineering Technicians	Mechanical Engineers
Surveying & Mapping Technicians	Surveyors

Graphic Communications

Graphic Communications Exploratory

The Graphic Communications Exploratory presents a broad overview of the graphic arts industry. In the printing/production area, emphasis is placed on production procedures that encompass all aspects of the printing industry. Students are exposed to print/production, Adobe Suite using InDesign, Illustrator, PhotoShop, offset press, bindery, prepress, screen printing, high-speed digitized imaging processes, and large format sign production. This exciting curriculum takes a hands-on approach to completing several projects. These projects include personalized tee shirts, custom notepads, posters, and notebooks using digital print technology. There are many employment opportunities in the area of graphic communications that will be reviewed.

Graphic Communications Shop 1

The Graphic Communications Shop 1 experience provides students with a more in-depth curriculum and takes a hands-on approach to complete a variety of projects in the Shop setting. Students will be given the opportunity to further their skills using the industry-standard software Adobe Creative Cloud. Through project-based learning, the students will have the opportunity to learn the basics of PhotoShop, Illustrator, and InDesign. The students are encouraged to express themselves creatively.

Graphic Communications Shop 2

The Graphic Communications Shop 2 course will provide students with a project-based learning curriculum as they complete a variety of tasks. Students will learn industry-standard software from the Adobe Creative Cloud platform while they use a 24" iMac computer. Students will focus on three main programs; PhotoShop, Illustrator, and InDesign. The project-based units will reinforce the software and techniques outlined in the Graphic Communications frameworks. Students will also be exposed to color Theory, typography, principles and elements of design, mathematical knowledge, and methods of measurement. During this course, students will learn how to communicate and use their interpersonal skills for future employment. In addition to learning software, students will learn and use other equipment such as the Roland VG-540 large format printer, the Royal Sovereign large format cold press lamination, and the Konica C7100 high-speed printer. This program is designed to prepare students for the Graphic Design/Print industry workforce.

Graphic Communications Technology Shop 3

The Graphic Communications Shop 3 specializes in printing production, digital graphics, and prepress. In the printing/production area, emphasis is placed on production procedures that encompass all aspects of the printing industry. Students are given experience in the form of integrated computer graphic systems, offset press, bindery, prepress, and proofreading, screen printing, high-speed digitized imaging processes, and garment embroidery. Students will learn to apply organizational skills. Students will be given the opportunity to demonstrate pre-production, production, and effective post-production practices. Students will learn to correctly scan images from different sources for a variety of uses, will learn to describe and apply photographic principles, and will learn to layout a page using desktop publishing software, and will learn to edit and create digital images using digital imaging software. Students will have the opportunity to create, design and layout a sign.

Graphic Communications Technology Theory 3
Students will continue with their examination of the major areas of specialization in the graphic communication industry. They will create a resume and learn effective employability skills. Develop additional skills in InDesign, Illustrator, and PhotoShop. Participate in live design/print contests. Learn basic math and estimating skills, job layout, and print production. Explore the history of printing from the development of the written word to the modern-day printing technology and paper-making processes. Be able to define a basic understanding of the printing industry and potential careers in the Graphic Communications Industry as well as its subsidiary businesses.

Graphic Communications Technology Shop 4
Graphic Communications Shop 4 is given in a graphic arts/director/client atmosphere. Professional-level problems will be stressed and solved with a concentration on layout, design, and the preparation of production. The course content will provide for a realistic development of job phases with respect to offset printing, bindery, silk screening, typesetting requirements, electronic graphic design, and garment embroidery. Emphasis is placed on production in the form of electronic page preparations. This course will give students hands-on experience with a computer-generated graphic, page layout, and preflighting software. Students will be responsible for completing jobs from layout and design, to font selections. In most instances, the student acts as a journeyman's apprentice. Students will also learn to enhance and apply their organizational skills. Students will learn to demonstrate effective pre-production, production and post-production, and publication practices. Students will be required to apply photographic principles, layout and design pages using page layout software, and integrate edited digital images. At an advanced level, students will also be required to create, design, and layout vinyl signage. Students will demonstrate the use of a vinyl cutter/plotter. Students will create and demonstrate various methods for transferring graphics onto a substrate.

Graphic Communications Technology Theory 4
Students will continue with their examination of the major areas of specialization in the graphic communication industry at an advanced level. They will describe effective workflow and production practices. They will be able to explain text and page composition, color science, vision, and printed color at an advanced level. Students will describe in detail the science of printing ink, substrates, and finishing and binding. They will be able to define the business of printing and careers in Graphic Communications.

Career Opportunities in Graphic Communications Technology:

Entry-Level Occupations

Entry-Level Graphic Designer
Press Assistant / Operator
Copy Center Operator
Silk Screen Assistant
Large Format Assistant/Operator
Pre-Press Assistant
Bindery Assistant

With Experience and/or Advanced Training

Project Director
Print Production Manager
Bindery Manager
Printing Press Operator
Operations Manager
Mailroom Manager

Lead Press Operator
Folder/Cutter Operator
Online Web Order System Manager
Graphic Arts Instructor
Silk Screen Operator
Database Manager
Graphic Designer
Embroidery Operator

Related Occupations

Copy Preparation Person
Production Manager, Advertising
Art Director
Layout and Design Person
Marketing Manager
Printing/Advertising Sales

Health Assisting/Pre-Nursing

Health Assisting/Pre-Nursing Exploratory
This course introduces the student to career opportunities in the health service industry, the second leading industry in the nation. A wide variety of techniques are used to stimulate student curiosity and assist students in assessing their suitability for a career in the health field. Hands-on experience is provided in the classroom and laboratory.

Health Assisting/Pre-Nursing Shop 1
Health Assisting/Pre-Nursing Shop 1 is an extension of the Health Assisting/Pre-Nursing exploratory program. The students are introduced to the study of direct care careers and community health careers. Shop safety, first aid, and communication skills are taught. Concepts of growth and development are incorporated. The students will also learn the importance of healthcare standards, professionalism in the role of a healthcare worker, and interpersonal skills. Students will become OSHA certified, obtaining the 10-hour Safety in Healthcare credential.

Health Assisting/Pre-Nursing Shop 2
The Health Assisting/Pre-Nursing Shop 2 is designed to build an awareness of the many dimensions of the healthcare field. Special emphasis is placed on developing professionalism, work ethics, and interpersonal skills. Concepts of nutrition, infection control, OSHA, HIPAA, body systems, and beginning Certified Nursing Assistant skills are introduced. English language arts are incorporated into the curriculum to enhance written communication and health documentation. Vital Signs, introduction to CPR, PPE use and purpose, gloving, and introduction to first aid are incorporated. The primary goal is to develop an awareness of the roles and responsibilities of the health assistant as part of the health team and to use this as a foundation of the healthcare ladder which will enable students to successfully continue on to the 11th-grade Shop.

Medical Terminology
The purpose of this course is to provide students with the basic knowledge of the language of nursing and medicine, and an understanding of how complex medical terms are formed. To obtain proficiency in analyzing medical words, students are exposed to knowledge of the word elements as they apply to nursing and medicine. This systemic approach to word building and term comprehension is based on the concept of word roots, prefixes, and suffixes. Students also learn the various meanings with which the elements may be used in different contexts to develop a broad understanding of the root element.

Health Assisting/Pre-Nursing Shop 3
The Health Assisting/Pre-Nursing Shop 3 curriculum is designed to provide students with learning experiences that will prepare them to meet the nurse aide certification requirements. The students are given opportunities to obtain basic nursing aide skills, personal care skills, and basic restorative services. Students are prepared to be tested by the Headmaster both for their clinical skills and their knowledge of the requirements for the Commonwealth of Massachusetts Nursing Assistant Certification. Students will also have the opportunity to certify in the areas of home health aide, Alzheimer's, basic life support for health care providers, first aid, and Stop

the Bleed. In addition, the Health Assisting/Pre-Nursing curriculum includes clinical experiences offsite in a long-term care facility. Mathematical skills are incorporated to strengthen the ability to do medical calculations.

Health Assisting/Pre-Nursing Theory 3
This course is focused on the common diseases and disorders the students will encounter in their clinical experience. Emphasis is placed on anatomy & physiology and the physical changes associated with health problems that require professional care. Other topics include communication skills, development of the critical thinking process, review and enhancement of medical terminology, and medical ethics.

Health Assisting/Pre-Nursing Shop 4
The Health Assisting/Pre-Nursing Shop 4 is designed for those senior students who have successfully completed the Health Assisting/Pre-Nursing Shop 3. Students are assisted with resume updates, applications and interview process for co-op positions if eligible. Students have the opportunity to explore the entry-level role of the pharmacy technician, develop skills in Electrocardiogram (EKG) analysis, and knowledge base in home health aide curriculum. Mathematical skills are also incorporated to strengthen the ability to do medical calculations. The goal is to prepare a multi-disciplined health care worker who is cross-trained for employment.

An Emergency Medical Response Technician course will be offered during the school year. This supplemental course utilizes innovative tools like the SimRig® The Ambulance Trainer to educate students to have the skills necessary for an emergency medical professional. This course is equipped with all the tools to help improve student efficiency and accuracy in emergency response so that they can prepare for a career in the emergency medical services industry. The SimRig is built to precisely mimic a real ambulance. The SimRig's enclosed design allows students to experience what it is like to work in a confined space like an ambulance, and more importantly how to overcome those environmental distractions. The back door and bumper are built to the actual specifications of a road-ready ambulance to allow students to efficiently practice loading and unloading stretchers, and performing lifesaving procedures in a limited space. Additionally, the students will have the opportunity to become familiar with Electrocardiogram equipment. Certifications include CPR, First Aid, and Basic Life Support.

Career Opportunities in Health Assisting/Pre-Nursing:

Entry-Level Occupations

Activities Assistant
Geriatric Aide
Nursing Assistant
Rehabilitation Aide
Alzheimer's Caregiver
Dietary Aide
Home Health Care Aide
Pharmacy Technician
Teacher Aide in Pediatric

With Experience and/or Advanced Training

Central Supply Technician
EKG Technician
Medical Assistant
Physical Therapy Aide
Patient Care Technician
Dental Aide
EMT/Paramedic
Phlebotomist
Respiratory Therapy Aide

Related Occupations

Dental Assistant	Laboratory Technician
Licensed Practical Nurse	Medical Assistant
Medical Records Technician	Medical Secretary
Professional Nurse (B.S.)	Respiratory Technician
Technical Nurse (A.D.)	X-Ray Technician

Heating, Ventilation, Air Conditioning & Refrigeration

Heating, Ventilation, Air Conditioning & Refrigeration Exploratory
This course provides freshmen exploratory students the opportunity to work with some simple tools of the HVAC&R trade, such as flaring tools, torches, swages, electrical pliers, voltmeters, etc. The freshmen exploratory student works on soldering, brazing, PVC piping, simple electrical circuits, and working with a Volt-Ohm-Meter. The classroom portion reviews safety rules and some theoretical facts found in the world that relate to the HVAC&R trade.

Heating, Ventilation, Air Conditioning & Refrigeration Shop 1
HVAC&R Shop 1 students continue with a more thorough introduction to the tools of the trade. They work with copper tubing, torches, brazing, and electrical components in order to become more familiar with these types of tools and fittings. A very thorough explanation of safety equipment and PPE used in the industry is covered at great length. Tool lists to be considered for the individual student are explained. Simple electrical circuits are built for the students to become familiar with schematic review, circuit testing, and circuit tracing.

Heating, Ventilation, Air Conditioning & Refrigeration Shop 2
This course concentrates on the acquisition of the skills necessary to use the basic tools of the trade. The program expands to include basic refrigeration systems and various types of refrigerants. Students cover in detail both the electrical and refrigeration systems of a domestic refrigerator and window air conditioning units. Students will complete employability skill assignments; employability skills are stressed throughout the program.

Heating, Ventilation, Air Conditioning & Refrigeration Shop 3
The HVAC&R Shop 3 concentrates on commercial refrigeration. Specific areas of study covered are refrigerants, refrigeration oil, compressor installation and servicing, methods of oil return, electrical wiring, and the installation and service of electrical components. This course concentrates on the acquisition of the skills necessary to use the basic tools of the trade. The program expands to include basic refrigeration systems, various types of refrigerants, and the use of refrigerant recovery equipment. Students cover in detail both the electrical and refrigeration systems of a domestic refrigerator as well as window air conditioners. The sixth edition of Refrigeration and Air Conditioning Technology as well as Heating and Cooling Essentials text will be used to support related and Shop instruction.

Heating, Ventilation, Air Conditioning & Refrigeration Theory 3
A thorough review of refrigerants, refrigeration, and system components begins this year. The issues of safety in the Shop and workplace are covered as well. A review of electrical circuits and symbols follows. Term 2 is an introduction to oil or gas heat with an emphasis on controls and components often found on these systems. Term 3 is for EPA Section 608 test preparation and examination. Students review employability skills regularly during the school year in the Theory class as they prepare for potential cooperative education opportunities.

Heating, Ventilation, Air Conditioning & Refrigeration Shop 4

This course provides for continued hands-on experience with the HVAC&R trade areas by working with sheet metal component identification and installation, gas furnace troubleshooting and installation, air conditioning component installation and troubleshooting, and proper maintenance and charging procedures for whole-house air conditioning. Students also become familiar with measurement tools used in the HVAC&R industry, such as airflow meters, anemometers, and psychometrics. Troubleshooting and proper wiring techniques are also learned. The ninth edition of Refrigeration and Air Conditioning Technology, Modern Refrigeration and Air Conditioning, 21st edition, and the Heating and Cooling Essentials texts will be used to support related and Shop instruction. Students have the ability to earn A2: Flammable Refrigerants certification.

Heating, Ventilation, Air Conditioning & Refrigeration Theory 4

Senior year begins with a review of oil or gas heat, electrical components, and schematic review. The issues of safety in the Shop and workplace are covered as well. Students are given 410A certification test preparation (a newer refrigerant) and are encouraged to take the exam (There is a cost to take the test). A complete discussion on system sizing and duct or hydronic system design is given. House construction consideration is discussed with a focus on air conditioning and heating loads. Students periodically review employability skills with emphasis on communication and other employment-based considerations.

Career Opportunities in Heating, Ventilation, Air Conditioning, & Refrigeration:

Entry-Level Occupations

Apprentice Refrigeration Technician	Counter Person
Helper	Limited Refrigeration Technician
Parts Person	Salesperson
Oil Burner Technician	Installers Apprentice

With Experience and/or Advanced Training

Applications Engineer	Engineer/Designer
Engineering Aid	Estimator
Foreman	Layout Technician
Licensed Refrigeration Contractor	Licensed Refrigeration Technician
Mechanical Engineer	Operating Engineer
Plant Engineer	Sales Engineer
Supervisor Test Technician	Teacher

Related Occupations

Installation Technician	Maintenance Technician
Salesperson	Service Technician

Hotel, Restaurant, and Tourism

Hotel, Restaurant, and Tourism Exploratory

The Hotel, Restaurant, and Tourism Exploratory presents a broad overview of the hospitality industry with an emphasis on hotel management, restaurant service, and the tourism industry. Students are introduced to the vast range of career opportunities that exist in these fields. Valuable knowledge is demonstrated through classroom instruction as well as hands-on participation in industry-specific projects in customer service through role-plays and restaurant dining room set up and service. Students will observe upperclassmen while touring the Artisan Restaurant and Cafe. The innovative curriculum places an emphasis on the development of employability and professional skills. Students in exploratory will also be given the opportunity to tour various career options in hotels.

Hotel, Restaurant, and Tourism Shop 1

Hotel, Restaurant, and Tourism Shop I will expose students to the Shop environments of the Artisan Restaurant and hotel partners. Students in the program will explore the lodging, food and beverage, events, and travel and tourism segments of the hospitality industry. Students will be assessed on their learning styles and their personalities and how to best communicate with each other. Students will begin to connect who they are to possible careers using the various segments. Students will demonstrate the proper steps to service in a restaurant using industry terminology and equipment. They will be provided with food safety training looking at personal hygiene, cross contamination, and sanitation practices.

Hotel, Restaurant, and Tourism Shop 2

The hospitality industry is a diverse and global industry offering countless opportunities in lodging, restaurant operations, travel and tourism services, gaming and entertainment, and recreation management. The Hotel, Restaurant, and Tourism Shop 2 provides students with a basic knowledge of the principles and fundamentals of the hospitality industry. Students are provided with a foundation in general customer service practices, management concepts, and theories that form the basis for success in the hotel, restaurant, and travel & tourism service industries. Students concentrating in this program area will acquire certifications in OSHA 10, Servsafe Allergen, and ServSafe Food Handler. Students will gain real-world experience in the school's Artisan Restaurant and function room focusing on dining room service skills. Students will also participate in the setup, service, and breakdown of school functions and events. Students are trained and acquire basic technical skills in dining, banquets, and customer service practices. Students will be able to participate in various industry tours, school functions, and volunteer opportunities. Students will demonstrate proper service etiquette, work ethic, and professionalism to gain experience and build confidence.

Hotel, Restaurant, and Tourism Shop 3

The Hotel, Restaurant, and Tourism Shop 3 course provides students with an intermediate knowledge of the principles and fundamentals of the hospitality industry. Students are provided with a foundation in specific customer service practices, hospitality soft skills, and the theories that form a basis for success in the supervision of customer service. The Shop will utilize the Hospitality & Tourism Management text and workbooks from The American Hotel and Lodging Educational Institute. Students will continue to focus on the refinement of basic skills with hands-on, individual training to connect classroom Theory to real-world practice. This technical

program provides on-the-job experience working in local hotels. Students will further develop their technical skills working in the following hotel departments: front desk, human resources, restaurant, kitchen, banquets, housekeeping, laundry, administration, accounting, and engineering. Students will continue to develop confidence through this process and start focusing on the direction their career may take. Students will gain real-world experience in our Artisan Restaurant and function room. Students will work to achieve their ServSafe Alcohol Certification prior to completion of Hotel, Restaurant, and Tourism Shop 3.

Hotel, Restaurant, and Tourism Theory 3

Hotel, Restaurant, and Tourism Theory 3 focuses on the organization and technical aspects of operating a successful lodging property with an emphasis starting and operating a business. Students will develop management concepts around ownership, business structure, laws, ethics, safety while addressing customer service and expectations through a curriculum in the Hospitality Services textbook. Students will also analyze employment handbook policy and procedures to reinforce employability skills. Students are required to complete a career action plan to outline their career plans and the steps they need to take for the plans identified.

Hotel, Restaurant, and Tourism Shop 4

The Hotel, Restaurant, and Tourism Shop 4 course will allow eligible students to participate in various cooperative education work-study programs with local hospitality businesses or work in a local hotel. Students not eligible for cooperative education positions will continue to work in the local hotels narrowing their focus to specific career direction building on competency levels, confidence, and employability. Students will further develop their technical and leadership skills working in the following hotel departments: front desk, human resources, restaurant, kitchen, banquets, housekeeping, laundry, administration, accounting, and engineering. The Shop will utilize the Hospitality & Tourism Management text and workbooks from The American Hotel and Lodging Educational Institute. The coursework will focus on leadership and managerial concepts, career development, operational leadership, and business management. Students are prepared for future employment or postsecondary education opportunities. Students will work to achieve their ServSafe Manager Certification and TIPS Certification in Hotel, Restaurant, and Tourism Shop 4 prior to graduation.

Hotel, Restaurant, and Tourism Theory 4

Hotel, Restaurant, and Tourism Theory 4 looks at developing effective business and leadership skills while examining entrepreneurship, sales and marketing, human resources, financial management, banquet and event management. The legal and ethical considerations and practices of managing a hospitality business will be reviewed. Students will be exposed to the airline and cruise industries and the career choices available to them. Students will work on a community-based project related to green initiatives and LEED Certification with local hotels.

Career Opportunities in Hotel, Restaurant, and Tourism:

Entry-Level Occupations

Banquet Attendant	Banquet Server
Banquet Set-up Person	Bell Attendant
Breakfast Café Attendant	Concierge
Dining Room Server	Door Attendant

Event Coordinator
Event Planner Associate
Flight Attendant
Front Desk Associate
Guestroom Attendant
Host/Hostess
Museum Special Events Coordinator
Museum Tour Guide
Reservationist
Resort or Cruise Ship Gift Shop Attendant
Room Service Attendant
Social Media Content Coordinator

With Experience and/or Advanced Training

Accounting Office Associate
Airline Food Service Manager
Airline Food Service Production Manager
Airport Terminal Manager
Banquet Captain
Banquet Sales Person
Bar Manager
Catering Sales Manager
Concierge Manager
Conference/Convention Sales Manager
Cruise Activity Planner
Cruise Advertising Coordinator
Cruise Ship Entertainment Director
Dining Room Supervisor/Manager
Director of Sales & Catering
Event Manager
Executive Housekeeper
Food & Beverage Manager
Front Office Supervisor/Manager
Group Sales (Rooms) Manager
Hospitality Marketing Manager
Hotel Chief Financial Officer – Controller
Hotel General Manager
Human Resources Director
Laundry Manager
Maintenance Manager
Payroll Manager
Purchaser
Receptionist
Reservation Supervisor
Restaurant Manager
Room Service Manager
Rooms Division Director
Sports Arena Manager
Theme Park Catering Manager
Theme Park Manager
Travel Agent
Travel & Tourism Manager

Related Occupations

Bartender
Casino Employee
Cruise Ship Staff
Sales Manager
Security Director
Spa Director
Travel/Tour Agent

Information Technology Services

Information Technology Services Exploratory
The Information Technology Services Exploratory introduces students to the aspects of the information technology and computer science fields. During the exploratory, students will learn how to develop websites, mobile apps, and video games using state-of-the-art software development environments. Students will also learn about the many different job opportunities and the many different career paths of Information Technology Services.

Information Technology Services Shop 1
In the Information Technology Services Shop 1, students will continue to develop mastery in the skills of art, science, and technology needed to develop websites, mobile apps, and video games. The curriculum integrates the rigor and relevance of STEM (science, technology, engineering, and mathematics) into fun and exciting web development, mobile app, and video game classroom projects. Students will demonstrate their proficiency by constructing an originally designed game/mobile app. The student's originally designed game/mobile app will incorporate the many competencies developed during the completion of the game/app development projects. Students will develop a website and the graphics showcase their work.

Information Technology Services Shop 2
The Information Technology Services Shop 2 is designed to further develop student knowledge in the fields of programming and web development and their mastery in the skills of art, science, and technology needed to develop websites, mobile apps, and video games. The curriculum continues to integrate the rigor and relevance of STEM (science, technology, engineering, and mathematics) into fun and exciting classroom projects. Students will be focusing on developing the fundamental knowledge and use of HTML, CSS, and JavaScript languages. Students will continue the development, uploading, and installation of mobile apps on the iOS and Android platforms that will be tested on iPhones/iPads and Android phones/tablets using app development tools. Students will be given the opportunity to develop video games. Students can also earn the opportunity to take several Information Technology Specialist Certifications and CIW Site Development Associate industry-recognized technical certification exams.

Information Technology Services Theory 2 - PC Technician
The CertMaster Learn Tech+ course was designed for students who want to prepare for the CompTIA Tech+ (FC0-U71) certification examination and for a solid foundation as a technology user. It utilizes a learning progression model to help you learn and build skills related to the course objectives, daily technology interactions, and career skills needed across a variety of fields. This learning methodology uses a series of steps to contextualize what you're learning, elaborate on areas where additional instruction is needed, and provide relevance through practice and personalized feedback. You'll then apply what you learned and demonstrate the skills you've gained through a series of lab activities, practice questions and quizzes. Upon completion, you will be able to take the CompTIA Tech + certification exam.

AP Computer Science Principles – Advanced Placement

Advanced Placement Computer Science Principles is designed to introduce students to the central ideas of computing and computer science, to instill ideas and practices of computational thinking, and to have students engage in activities that show how computing and computer science are changing the world. In this course, students will learn how to access the world of mobile services and applications as creators, not just consumers. They will learn to create entertaining and socially useful apps that can be shared with friends and family. In addition to learning to program and how to become better problem solvers, students will also explore the exciting world of computer science from the perspective of mobile computing and its increasingly important effect on society. This course is part of a national project through the College Board and National Science Foundation and is an Advanced Placement-level course. Students will have the opportunity to take the College Board Advanced Placement Computer Science Principles Exam to potentially earn college credits.

Information Technology Services Shop 3

The Information Technology Services Shop 3 is designed to further develop student knowledge in the fields of programming and web development attained from Information Technology Services Shop 2. Students will continue developing their competencies in planning and developing programs that apply the use of functions, methods, and procedures. Students will apply the techniques of good GUI design techniques through procedural and object-oriented programming structures in the development of their programs. Students will develop programs using Visual Basic and C#. Students will develop programs that include the use of arithmetic relational and logical operators, iterative and conditional looping, sort routines, file handling, and arrays. Students will do this through the development of structures, functions, objects, methods, and classes. Students will work on their team, software testing, and project management skills by developing a game and publishing a website to promote their game. Students will be introduced to Relational Database Management systems. Students will be introduced to the Linux operating system and basic scripting and complete the Amazon Web Services Foundations course. Students will prepare for and get their OSHA 10 certification. Students will prepare for and take the Microsoft Technology Associates Software Development Fundamentals Certification Exam. Finally, students will create a professional resume, digital portfolio and work on job interview and employability skills in preparation for cooperative education opportunities.

Information Technology Services Theory 3 – Intro Computer Technician CompTIA A+ Essentials

This course provides students with the knowledge to become industry certified as Computer Technicians, a major requirement of our current cooperative education employers. This course meets the specifications of two different industry certifications and CVTE Frameworks Industry Recognized Credentials, and the CompTIA A+ Hardware/Software, PC Pro certification. The course also introduces students to competencies required for SkillsUSA competition areas of Information Technology Services and Technical Computer Applications. This certification measures not just what you know, but what you can do. It measures your ability to install, manage, repair, and troubleshoot PC hardware and Windows, Linux, and Mac operating systems. This course will be taught through the combination of traditional hands-on demonstration using real hardware and software, lecture, and the use of state-of-the-art interactive virtual training using TestOut LabSim.

AP Computer Science A – Advanced Placement

The Advanced Placement Computer Science A course introduces students to computer science with fundamental topics that include problem-solving, design strategies and methodologies, organization of data (data structures), approaches to processing data (algorithms), analysis of potential solutions, and the ethical and social

implications of computing. The course emphasizes both object-oriented and imperative problem solving and design. These techniques represent proven approaches for developing solutions that can scale up from small, simple problems to large, complex problems. The course prepares students for the College Board's AP Computer Science A Exam.

Information Technology Services Shop 4

The Information Technology Services Shop 4 continues to build on all competencies, skills and knowledge attained in 11th grade. All students will learn Java Programming; some students will take AP Computer Science A, while others will learn Java Programming at the high school level, including Java Basics, Methods, Classes, Object-Oriented Programming, and Data Structures. Students will also learn to program the Arduino microcontroller board using the Python programming language. This course provides the prerequisite information needed before students apply programming concepts to their physical Arduino device. In addition, students will have the option of earning one of two Google Career Certificates: IT Support or Data Analytics. Finally, students will also complete team assignments and a range of assignments in which they will read, discuss, and write about industry topics.

Information Technology Services Theory 4 - Computer Technician Network Pro or Security Pro. (Senior Path Choice)

Expanding upon what was learned in Information Technology Services Theory 3- Computer Technician A+ Essentials, students will be provided with the knowledge to become industry certified as a PC technician, a major requirement of our current cooperative education employers. This course meets the specifications of two different industry certifications and CVTE Frameworks Industry Recognized Credentials, and the CompTIA A+ PC PRO certification and advancing to the Network Pro or Security Pro are part of the program. Students gain the knowledge and skills they need to install, configure, and maintain a network for a small business. They decide which path they would like to take in Theory 4. The course also introduces students to competencies required for SkillsUSA competition areas of Information Technology Services and Technical Computer Applications. This course will be taught through the combination of traditional hands-on demonstration using real hardware and software, lecture, and the use of state-of-the-art interactive virtual training using uCertify labs.

Security Pro is a curriculum that helps you provide engaging content and hands-on, experiential training and certification preparation on the latest security tools and techniques. With improving student outcomes as a top priority, this courseware allows you to focus on teaching while providing the tools you need to effectively organize your class and teach, monitor, and assess your students.

Career Opportunities in Information Technology Services:

Entry-Level Occupations

Computer Technicians	Technical Support/Help Desk
Assistant Network Administrator	Associate Computer Programmer
Video Game Tester	Associate Web Designer/Developer
Mobile App Tester	Network Support Specialist
Penetration Tester	Software Tester

With Experience and/or Advanced Training

Software Engineer	Database Administrator
System Analyst	Mobile App Developer
Information Technology Manager	Video Game Developer
Web Developer/Master	Senior Programmer
Video Game Designer	UI/UX Designer

Related Occupations

Network Administrator	Security Administrator
Cybersecurity Engineer	Project Manager
QA Engineer	Desktop Publisher
Network Architect	Technical Writer
Database Architect	Technical Trainer

Marketing

Marketing Exploratory

The Marketing Exploratory program will introduce and explore career opportunities in business, marketing, social media marketing, digital and internet marketing, email marketing, how to create a new product or service, product market research, business fundamentals, product placement, and advertising. Students will learn the "4 P's" of marketing (product, price, promotion, and place) with hands-on activities in creating new products and services, promoting and advertising a new product and service, how products and services are priced, and how/where products are sold (retail and/or online stores). The students will also be given an overview of the Marketing Mall stores, which consist of four different store experiences, to effectively create, operate, and manage a business.

Marketing Shop 1

Marketing Shop 1 is designed to provide students who plan to enter this program with the basic skills and abilities necessary for success in the program. Students will be given the opportunity to progress at their own rate by use of competency-based projects and methods of instruction. Students will have the opportunity to participate in a mentoring program with junior/senior level students in a variety of job-site situations in the Marketing Mall stores. Hands-on learning activities in the mall, as well as related instruction, will give each student an opportunity for self-expression through meaningful experiences. Computer applications will be utilized to design promotional flyers, create advertisements, and participate in a team advertising project. This project is designed for the student to obtain an understanding of the role of marketing in keeping up with industry standards.

Marketing Shop 2

The Marketing Mall stores provide each student with experiential learning activities which aid in the development of basic marketing and work-ready skills. Each student is challenged to achieve acceptable performance at a rate that is consistent with their ability, interest, and initiative. Competency-based learning materials provide activities that allow each student the opportunity to participate and perform tasks that are appropriate to marketing occupations. At this level, marketing studies and activities include customer relations, retail, advertising, and financial analysis. Students will learn purchasing for resale, merchandising products, and inventory control systems using a point of service system. In addition, students learn the importance and are responsible for cash/credit control systems, cash/credit handling, and cash/credit management for the Marketing Mall stores. Students will file weekly treasurer reports and monthly sales tax reports.

Students will learn, apply, and perform fundamental financial concepts and business operations. Financial concepts include insurance (life, property, health, and auto insurance), payroll and budgets (personal, family, and business), taxes (sales, property, and excise), and services offered by financial institutions. Students will begin to develop project management skills and understand business operations by working in teams with upperclassmen. Weekly safety health knowledge and skills are incorporated to ensure a safe and organized work environment for all.

Current technology is integrated into the Marketing Shop 2 curriculum and is designed to enrich student understanding and experience in the Marketing industry. Students will lean both MS Office Suite – Word, Excel, PowerPoint, as well as Google Workspace applications – Docs, Sheets, Slides, GMail, and Drive. In addition, Adobe Creative Cloud and Canva are introduced for Advertising and Digital Marketing. The Clover POS system

is used to operate the Marketing Mall stores. The system allows students to learn tracking and reporting operations, inventory management, sales/cash flow, customer and employment management. Sophomore students are responsible to work collaboratively with the Junior students to fully operate and maintain these stores.

Students will begin to identify and utilize various electronic media for promotional marketing, information, and training materials for school-wide general communications. Students will use electronic media as a tool for developing brand recognition and product positioning. Group projects will be used to explain various ways in which a company can utilize its website and analyze social media to develop effective communications with specific target markets. In addition, students will develop and be responsible to present their work and manage their time efficiently.

Topics such as social media, brand management, sports and entertainment marketing, e-commerce, digital marketing, database management, and advertising will be introduced.

Marketing Shop 3

Students in Marketing Shop 3 are ready to implement actual management experience in various areas of the three Marketing Mall stores, Kiosk, and CVS. This includes all aspects of operations, merchandising, and displaying. In addition, the students work on a curriculum called School Store Operations and the Functions of Marketing during their junior year.

Students are responsible for the management and mentoring of underclassmen within each department of the school stores. Their duties include buying, pricing, receiving, advertising, sales, displaying, and all back-office cash reports, and treasury reports for the stores. Students also train on the Clover System, a computerized POS system that includes three computer POS terminals, and hand-held Flex Remote Registers that they can use to sell merchandise throughout the building and at our Marketing Kiosk. Clover is a fully integrated, online retail management system that provides students with advanced technical training. The system includes point of sale, inventory control and general ledger, scanners, and barcode ticketing. Clover also has a customer database that allows students to communicate with customers via text messaging and email regarding sales and promotions in all of the Marketing Mall stores.

Students are also provided the opportunity each year to work with outside vendors that are invited into the school. In addition, students learn how an open to buy works when we purchase and plan the merchandise for the stores for the next school year. In addition, they learn how to write purchase orders as well as process the orders through our Internal Purchase Requisition System. This provides the students with an overall view of various retail store operations, the functions of management, and an opportunity to actually experience the relationship of the many areas of employment in the field of marketing. Students will have the opportunity to participate and become bank trained in the Greater Lowell Teller Training Program located within the school's branch of the Lowell Five Savings Bank.

All students are encouraged to participate in SkillsUSA, a national organization for the development of future leaders in the areas of marketing and management. Curriculum materials meet the National Marketing Education Standards and the Massachusetts Vocational Technical Frameworks.

Students will work on a variety of real-world projects that will prepare them for a career in the marketing industry. Students will learn how to use social media and web-based job search sites, the importance of keywords, and develop an understanding of how to use local resources to grow their careers. More advanced lessons on social media and computer-based applications will be applied to class projects.
Students will utilize social media, brand management, sports and entertainment marketing, e-commerce, digital marketing, database management, and advertising will be introduced

Marketing Theory 3
Marketing Theory 3 will consist of accounting and website marketing. In accounting, students will learn the process of planning, recording, analyzing, and interpreting financial information. Throughout the course, students will learn how to keep financial records for a service company. Students will conduct a series of accounting activities including recording financial information for this service company. This course will prepare students to understand the purpose of the accounting system and demonstrate an understanding of the accounting equation. Students analyze transactions into debit and credit parts. Students will record transactions into a general journal, and then post the journal entries to a general ledger. Students will also do project related activities, such as analyzing public companies' financial statements, the importance of business ethics and code of conduct, and relate the accounting concepts to the marketing mall Shops.

In web-based marketing, students will learn how websites and digital marketing impact businesses and organizations. Students will learn how to use social media tools and email marketing to analyze and develop effective communications for businesses and organizations. Students will learn how electronic media and online advertising is used as a tool for developing brand recognition and product positioning. Students will learn how Internet viral activity impacts a business, and will analyze effective viral and buzz marketing strategies.

Marketing Shop 4
In Marketing Shop 4, students have access to the Cooperative Education Program. The Cooperative Education Program provides students with an exciting opportunity to expand their educational knowledge and experience in a real work environment that directly relates to their career goals. Students gain valuable employability experience while furthering their understanding of their occupational field within a structured, supervised environment.

Students not participating in cooperative education experience will learn Fashion Marketing and Merchandising, which provides students with the most current information about the basic concepts and business aspects of fashion marketing and merchandising. It introduces students to the field of fashion promotion and provides foundational fashion concepts related to economics, textiles, and design—all critical aspects of the industry. Technological advances in manufacturing, mass customization, niche specialization, inventory planning, management, and execution is included, as well as retail trends such as omnichannel retailing and showrooming. In addition, the students will continue to learn essential career skills and career opportunities.

There will be focus on personal development, job readiness, and continuing to prepare themselves for the world of work in a marketing and business environment. They will continue to develop their consumer math skills for finance and business. They will also work on event planning, advertising, social media, written and verbal communication, research skills and problem-solving skills. Applied learning strategies are emphasized to

demonstrate transferable skills, changing work skills, and the impact technology has on their career. The Shop instructor will continue to work with all students to assist the student in a cooperative education placement.

Marketing Theory 4
Marketing Theory 4 focuses on the development of future entrepreneurs. This course concentrates on the skills, characteristics, and knowledge necessary to be a successful entrepreneur. Students will enhance their knowledge from previous course knowledge, such as accounting, business operations, digital and social media marketing, advertising, customer service, marketing research, marketing Shop, and cooperative education experience to create and develop a business plan. The business plan will consist of identifying a business opportunity, developing a business description, conducting market research, creating a marketing plan, organizational structure plan, financial plan, and projected financial and investment data. Students will learn how to prepare proposed financial statements, such as balance sheets and income statements. In addition, students will learn how to identify business and market needs; product distribution, business, and product promotion and selling; different types of ownership structures, selecting a business location; planning and tracking business finances; human resource management; risk management and best practices in business management. The students will also do project-based activities on researching, analyzing, and focusing on successful entrepreneurs and companies.

Commonwealth Collegiate Academy (Marketing/Business Pathway)
The Commonwealth Collegiate Academy (CCA) of the University of Massachusetts is designed to increase early college opportunities for high school juniors and seniors in partner schools, with a special emphasis on the matriculation of ethnically diverse, first-generation, economically disadvantaged, and under-served students. The CCA early college partnership will provide enrolled students with increased academic rigor, challenge, and an intensive introduction to university-level work to support a smoother transition into higher education. Students will have the opportunity to earn university credits while at the same time satisfying high school graduation requirements, spend time on a University of Massachusetts campus to engage in college awareness activities and learn more about career options and college majors.

Participation in CCA courses is offered to students upon grade-level attainment and teacher recommendation. The courses offered are intended to support students within the pathway by accelerating the meeting of UMass Lowell business/marketing-related degree requirements. More information can be found at:
https://cca.massachusetts.edu/

ENTR.1500 Introduction to Entrepreneurship and Business – Early College
https://www.uml.edu/catalog/courses/entr/1500
Entrepreneurship can be considered a process of economic or social value creation, rather than the single event of opening a business. This course focuses on creativity, innovation, problem identification, opportunity recognition, developing solutions, and resource acquisition. The functional areas of business and the cross-functional nature of these will be demonstrated as student teams will address problems they discover.

ACCT.2010 Accounting/Financial – Early College

https://www.uml.edu/catalog/courses/acct/2010

Presents a comprehensive, detailed exposure to basic accounting Theory. Beginning with the accounting equation, students are introduced to the accounting cycle, preparation of the statement of financial position and the income statement, accounting for assets, liabilities, and stockholders' equity of the firm, and cash flow and financial statement analysis.

Career Opportunities in Marketing Education

Entry-Level Occupations

- Advertising & Publication professional
- Assistant Buyer
- Bank Teller
- Cashier
- Customer Service Representative
- Insurance Sales Representative
- Marketing Assistant
- Marketing Research Assistant
- Public Relations Assistant
- Retail Sales / Management
- Visual Merchandiser Assistant
- Wholesale & Manufacturers Representatives

With Experience and/or Advanced Training

- Accountant
- Account Representative
- Advertising/Display Manager
- Advertising Sales Representative
- Assistant Buyer
- Assistant Manager
- Business Development
- Buyer
- Cash Office Manager
- Customer Service Representative
- Digital and Social Media Marketer
- Email Marketer
- Event Coordinator and Planner
- Event and Trade Show Marketing
- E-Commerce Representative
- Entrepreneur
- Exhibits and Promotions Manager
- Management Trainee
- Marketing Researcher
- Marketing Education Teacher
- Merchandise Manager
- Operations Manager
- Product Marketer
- Purchasing Agent
- Search Marketing (Google)
- Social Media Specialist
- Store Manager
- Store Owner
- Training Director

Related Occupation

- Accountant
- Account Representative
- Advertising/Display Manager
- Advertising Sales Representative
- Assistant Buyer
- Assistant Manager
- Brand Marketing
- Communication Manager
- Construction Marketing
- Customer Service Representative
- Department Manager
- Fashion Marketing
- Financial Services Marketing
- Food Products Marketing
- Health Products & Service Marketing
- Insurance Marketing

International Marketing
Online Advertising and Marketing
Pricing Analyst and Specialist
Marketing Communications
Real Estate Marketing
Public Relations
Sports and Entertainment Marketing
Internet Marketing
Paid Search Manager
Manufacturer's Sales Representative
Media Planner (TV, Radio, Films, Online)
Recreation & Hospitality Marketing
Retail Marketing Operations
Tourism & Travel Marketing

Masonry

Masonry Exploratory
This program introduces the student to the various career opportunities in the masonry field coupled with a history of the trade. The course provides a brief exposure to the basic tools, measuring devices, and materials used in masonry. Practicing the techniques of hardscape work and pavers will help students develop an awareness of the skills necessary to succeed in a masonry career. Projects include working on outdoor fireplaces and pavers.

Masonry Shop 1
Masonry Shop 1 is an extension of the Masonry Exploratory program which expands on the use of the basic hand tools, measuring devices, and materials through the actual construction of projects in the Shop. Sufficient related work is covered to give an understanding of these basic projects.

Masonry Shop 2
Masonry Shop 2 exposes the student to a variety of tools used in the masonry field and why, where, and how they are used and maintained. Students are shown basic brick and block bonding, types of jointing, and how to plan basic concrete flatwork.

Masonry Shop 3
This program covers concrete block construction, block types, modular planning (modular spacing ruler), installation of windows, doors and lintels, bonding, and block chimneys. Concrete construction, planning, mixing, pouring, finishing, curing, testing and jointing, and reinforcing are also covered in this Shop.

Masonry Theory 3
The Masonry Theory 3 course emphasizes the principles and Theory of concrete block construction, block types, modular planning (modular spacing ruler), estimating, installation of windows, doors and lintels, bonding, block chimneys, concrete construction, planning, mixing, pouring, finishing, curing, testing, jointing and reinforcing. Operation of various power equipment and estimating masonry materials will also be covered. Masonry Theory 3 uses Modern Masonry, 9th edition.

Masonry Shop 4
Students in this Shop are involved in concrete formwork, construction of footings and foundations, columns, beams and lintels, chimney construction, fireplace construction, brick walls, and partitions (buttresses, pilasters, arches, refractory brick). Maintenance, repair, and improvement of brickwork are also covered.

Masonry Theory 4
The Masonry Theory 4 course emphasizes the principles and Theory of concrete formwork, design, and construction of footings and foundations; columns, beams, and lintel design and chimney design, fireplace design and construction, brick walls and partitions (buttresses, pilasters, arches, refractory brick). Maintenance, repair, improvement, and computer estimating are also studied in this course. Masonry Theory 4 uses Residential Construction Academy: Masonry, Brick and Block, 1st edition.

Career Opportunities in Masonry:

Entry-Level Occupations

Apprentice Bricklayer
Apprentice Cement Finisher
Apprentice Materials Handler/Tender
Apprentice Stonemason

With Experience and/or Advanced Training

Building Inspector
General Contractor
Masonry Contractor
Journeyman Bricklayer Stonemason
Cement Mason
Project Estimator
Tile Setter
Plasterer
Teacher

Related Occupations

Concrete Form Installer
Masonry Store Clerk
Gunite/Shotcrete Pool Installer
Stone Countertop Installer

Medical Laboratory & Assisting

Medical Laboratory & Assisting Exploratory
This course introduces students to skills and characteristics necessary for success as a medical assistant. A brief overview of various fields of medicine are discussed, as well as potential workplace opportunities. Students will have the opportunity to perform vital signs, first aid simulation, laboratory techniques, as well as infection control procedures. Patient rights and pharmacy techniques are included for added experience. A strong emphasis on communication and empathetic caring is woven throughout the curriculum. Students will learn the importance of compliance, comprehension, and self-advocating for knowledge acquisition, as these all relate to patient safety. A variety of teaching, learning, and assessment techniques are used to enhance the learning experience.

Medical Laboratory & Assisting Shop 1
The Medical Laboratory and Assisting Shop 1 provides students with an introduction to medical assisting. A variety of activities, including administrative and clinical skills, are presented. Students gain knowledge in the fundamentals of medical assisting as well as safety. They are exposed to the basic skills necessary when interacting with patients. Basic medical terminology will be introduced during this time. All students will be instructed on uniform guidelines and ordering procedures to facilitate a smooth transition to Medical Laboratory & Assisting Shop 2.

Medical Laboratory & Assisting Shop 2
The Medical Laboratory & Assisting Shop 2 introduces the students to the role of the Medical Assistant in medical practice, hospital, or outpatient settings. The clinical procedures and techniques will include taking a patient's medical history, performance of medical asepsis, sterile technique, vital signs, audiology, visual acuity testing, documentation, and patient education. Students will practice assisting with physical exams and specialty procedures such as minor surgical procedures, obstetrics and gynecology, pediatric exams, and rehabilitative medical procedures. The use of specialty medical equipment including, the autoclave, ultrasonic cleaner, surgical instruments, audiometer, Titmus Vision Screener, spirometer, and nebulizer, will be experienced. Special emphasis is placed on developing professionalism, work ethics, interpersonal skills, and effective communication. Concepts of growth and development, infection control, OSHA, HIPAA, anatomy and physiology, and basic disease pathology are also covered.

Medical Terminology
The purpose of this course is to provide students with the basic knowledge of the language of nursing and medicine and an understanding of how complex medical terms are formed. To obtain proficiency in analyzing medical words, students are exposed to knowledge of the word elements as they apply to nursing and medicine. This systemic approach to word building and term comprehension is based on the concept of word roots, prefixes, and suffixes. Students also learn the various meanings with which the elements may be used in different contexts to develop a broad understanding of the root element.

Medical Office Management 1
This interactive/hands-on course is an introduction to the administrative procedures and skills necessary to operate a basic medical office practice. Medical office procedures covered will include basic computer operations and keyboarding, telephone and reception techniques, appointment scheduling, electronic medical records use management, and written and verbal correspondence. Instruction regarding medical insurance types, application, billing, coding, and collections are given, along with basic bookkeeping. Special emphasis is placed on developing professionalism, work ethics, interpersonal skills, and effective communication as it relates to medical office management, including co-worker and patient interaction.

Medical Laboratory & Assisting Shop 3
The Medical Laboratory & Assisting Shop 3 introduces the student to the practical application of clinical laboratory procedures, dosage calculation, and medication administration, and basic nutrition. Students will be instructed in laboratory safety, aseptic technique, patient safety including, the CLIA law, and the proper use of universal precautions. Emphasis will be placed on incorporating realistic clinic situations and critical thinking skills. Students will be expected to employ the skills they have learned in varied situations. Instruction will include the capillary finger stick procedure, which requires that all students be clinically certified before being allowed to puncture independently. Simple to complex procedures will include hematocrit, hemoglobin, glucose, ABO blood typing, WBC differentiation, simple tissue stains, and the Gram stain technique. Students will be introduced to microscopy, as it relates to observing blood cells and bacteria. Each procedure learned will include the clinical relevance of the test, the appropriate documentation, and the basic interpretation of the laboratory results. Students will be introduced to phlebotomy using venipuncture training arms. This training will include the correct tubes and additives for each laboratory test. In addition, emphasis will be placed on clinical technique, specimen handling, labeling, charting, and professionalism. Each student must also complete a 10-hour OSHA certification course. which is required for cooperative education.

Medical Laboratory & Assisting Theory 3
This course offers a theoretical framework curriculum to enhance understanding and knowledge of the medical assisting and laboratory procedures covered in Medical Laboratory and Assisting Shop III. Students will sharpen their critical thinking skills by connecting pathophysiological conditions and bodily functions to the procedures performed. A curriculum on nutrition for health care providers will be applied covering nutrition needs throughout the lifespan, as well as nutritional diseases and disorders. Previous knowledge will be assessed consistently to allow for prioritization of learning needs in order to adapt and adjust the curriculum.

Medical Laboratory & Assisting Shop 4
The Medical Laboratory & Assisting Shop 4 is designed to further develop student knowledge and skills in the healthcare field. Students will practice their clinical skills as well as build on prior knowledge to prepare for certification and/or employment as a Certified Clinical Medical Assistant. Pathophysiology will be a focus as students participate in research and reporting. Emphasis is placed on team building, leadership development, and project-based learning.

Medical Laboratory & Assisting Theory 4
This senior year course aligns with Medical Laboratory and Assisting Shop 4 for enhancement of procedures and skills necessary to obtain certification and/or employment as a Certified Clinical Medical Assistant. Assessment

of prior knowledge with review of necessary curriculum is provided to ensure workplace readiness in the medical field. An introduction to psychology will be presented with emphasis on life-span human growth and development as well as mental health, wellness and abnormal psychology basics. Students will apply this knowledge to patient care simulation using critical thinking and use of resource-based research.

Career Opportunities in Medical Laboratory & Assisting:

Entry-Level Occupations

Administrative Medical Assistant
Records Management Clerk
Medical Office Manager
Medical Lab Assistant/Technologist
Blood Bank Technician
Specimen Processing Technician
Clinical Medical Assistant
Phlebotomy Technician
Certified Medical Assistant (in specialty areas i.e., Pediatrics)
Ophthalmology, Internal Medicine

With Experience and/or Advanced Training

Central Supply Technician
EKG Technician
Physical Therapy Aide
Dental Aide
EMT/Paramedic
Respiratory Therapy Aide

Related Occupations

Laboratory Technician
Medical Assistant
Respiratory Technician
Licensed Practical Nurse
Professional Nurse (B.S.)
Technical Nurse (A.D.)

Metal Fabrication & Joining Technologies

Metal Fabrication & Joining Technologies Exploratory
The primary purpose of this program is to expose ninth-grade students to the equipment, power machinery, hand tools, and welding joining processes of the metal fabrication trade. This course covers the safe use of equipment in both forming and welding metals. Included are small projects that are fabricated and welded in the Shop environment. Students will also receive hands-on basic skills in gas metal arc welding. This course is designed to give the students an overview of this trade to assist them in deciding their major area of study.

Metal Fabrication & Joining Technologies Shop 1
This program is an extension of the metal fabrication/welding exploratory program. During Metal Fabrication & Joining Technologies Shop 1, each student will fabricate and weld their own hands-on projects, which not only develops student skills but also encourage creativity. The objective of this course is to expose the student to the many areas of the welding industry and to increase the student's confidence in their ability.

Metal Fabrication & Joining Technologies Shop 2
Metal Fabrication & Joining Technologies Shop 2 allows students to perform metal layout and fabrication of both sheet metal and structural metal projects. Additionally, they will be able to join metals with various welding equipment such as oxy-fuel, ARC welding, and MIG welding processes. They will safely perform work with both hand tools and power equipment to both shape and form metals.

Metal Fabrication & Joining Technologies Shop 3
This program allows students to advance in the field of metal fabrication using different types of welding techniques for joining metals, both ferrous and nonferrous. Students will further develop their skills using power-forming machines in the fabrication of Shop projects. There is an emphasis on print reading and layout methods for both sheet stock and structural materials.

Metal Fabrication & Joining Technologies Theory 3
Metal Fabrication & Joining Technologies Theory 3 introduces students to the career field of metal fabrication. Emphasis is placed on safety, tool recognition, machinery, and their capacities to assist the fabricator. Math, measuring, and blueprint reading used in the manufacture of sheet stock and structure materials are stressed. Classroom projects and homework assignments are used to further the student's understanding of their potential to become quality craftsmen.

Metal Fabrication & Joining Technologies Shop 4
This program is an extension of Metal Fabrication & Joining Technologies Shop 3 with an emphasis on working with minimal supervision. During this course, the student will be evaluated on both the quality and quantity of welding and fabrication skills that they have attained. Students will also be taught the basic responsibilities of an employee to their employer and how one must take care of both machinery and tools which they are required to use and operate.

Metal Fabrication & Joining Technologies Theory 4

This course concentrates on the area of blueprint reading for the metal fabricator. Specific elements, such as three-view drawings, dimensional drawing, tolerances, welding symbols, templates, and bending fabrication comprise much of the course. The students will also further develop their welding background in related areas of metallurgy terminology, quality assurance, design, and layout methods.

Career Opportunities in Metal Fabrication:

Entry-Level Occupations

Apprentice Fabricator
Arc Welder (all phases)
Tungsten Inert Gas Welder
Iron Worker
Oxy. Acet. Welder and Cutter
Press Brake Operator
Punch Press Operator
Shear Operator
Sheet Metal Worker Apprentice
Supervisor

With Experience and/or Advanced Training

Factory Representative
Heating & Ventilating Air Conditioning Spec.
Metal Fabrication Teacher
Precision Sheet Metal Inspector
Precision Sheet Metal Model Maker
Project Estimator
Shop Owner
Welding Engineer
Welding Inspector

Related Occupations

Drill Press Operator
Factory Bench Hand
Grinder
Salvage Yard Person
Spot Welder
Stock Handler
Welding Supply Delivery Person
Welding Supply Store Clerk

Painting & Design

Painting & Design Exploratory
Today's painting & design field offers a variety of career opportunities including interior and exterior painting, wall covering, sign art, faux finishing, historical renovation, theatre set design, mural art, interior design, and much more. This exploratory is an exciting, fast-paced, hands-on class that encourages students to express their creativity and artistic talent in a variety of innovative painting and design projects. Working both cooperatively and independently, students will learn interior and exterior painting techniques, how to coordinate colors, have an eye for detail, and create one-of-a-kind spaces using the elements of design. In addition, students will be introduced to OSHA safety guidelines, develop employability skills and learn about the basics of entrepreneurship for the painting contractor and interior designer.

Painting & Design Shop 1
This course is a continuation of the exploratory program and expands on the topics introduced in that course. Students will develop basic skills in surface preparation, wall applications, faux finishing techniques, estimating, and job planning. Hands-on projects and critical thinking skills are emphasized in this program. Students will work on developing employability skills and positive work behaviors. Students will be introduced to the basics of management and entrepreneurship for the painting and design contractor.

Painting & Design Shop 2
In Painting & Design Shop 2, students learn to use various painting techniques. Students now become familiar with staining, matching paint, color Theory, and paint failures. Curriculum content also includes an intro to wallcovering, faux finish techniques and intro to computer aided sign making. Students will become knowledgeable in the safe use of a variety of tools. Students are trained on the use of these tools and equipment to produce a finished product of high quality. Students will also develop skills in the area of cost and material estimation.

Painting & Design Shop 3
Students in Painting and Design Shop 3 are given more in-depth experience in the painting and design trade. They are exposed to complicated techniques, which require greater skill and craftsmanship, such as the setting up of staging, troubleshooting paint failures, and selecting their remedies. Students will learn advanced wallcovering and faux finishing techniques and apply them to various surfaces. Students will learn how to prepare estimates, overhead expenses, surface identification, and preparation. They will also gain experience with CAD applications and will participate in large format sign design and are also exposed to various types of wallcoverings and their applications. Students will have the opportunity to work on off-campus projects and to develop their skills further. Students will be a part of the school's house-building project. Cooperative education placements are available in the 3rd quarter to 11th-grade students who meet the school's criteria.

Painting & Design Theory 3
This course further develops students' knowledge about the elements of painting and design. Student instruction will include, but is not limited to, paints and coatings, wallcovering, decorative finishes, furniture styles, spray painting, floor plans, textiles, and color Theory. Students will create resumes and job portfolios in preparation

for employment through our cooperative education program. Within the first semester of this program, students will have the opportunity to successfully train and receive their OSHA 10-hour card in construction.
The curriculum is based on a variety of trade books including, the Blue Print Reading for Construction and Housing and Interior Design. Reading, writing, and mathematics assignments related to the painting & interior design industry are an important part of this course. Students will also learn about colleges and universities.

Painting & Design Shop 4
This final year is used to develop speed, accuracy, and a greater understanding of the trade and professional business practices, preparing job estimates, figuring material and labor costs, time allotments for certain jobs, etc. Students are allowed to work more independently within the Shop and around the school and are given more responsibilities such as assisting underclassmen with their duties. Various types of spray painting, such as conventional, airless, and HVLP, will be used throughout the school year. Students will learn commercial wallcovering applications and will participate in large format sign design and painting projects. As students expand their expertise in the painting and design trade and improve the quality of their work, they will increase the potential opportunities for higher wages and greater chances of employment in the many areas of the painting and interior design field. Cooperative education is available to 12th-grade students who meet the school's criteria, as students put their training to use in the workplace.

Painting & Design Theory 4
In this course, students will become proficient in their technical knowledge of painting & interior design technologies. Students will create their own interior design board showcasing a collection of materials, drawings, inspiration, sketches, and finishes, to present their design idea visually. The curriculum is based on a variety of trade books including Print Reading for Construction and Housing and Interior Design. In addition, students will continue to build upon their resumes and job portfolios in preparation for employment through our cooperative education program, as well as, employment after graduation. Students will also be supported in applying to colleges and universities with painting or interior design programs as they prepare for a successful career.

Career Opportunities in Painting & Design:

Entry-Level Occupations

Union Apprentice Painter
Drywall Finisher
Commonwealth of Massachusetts Painter 1
Paint & Wallpaper Sales Associate
Construction Painter
Faux Finisher
House Painter (Interior & Exterior)

With Experience and/or Advanced Training

Industrial Sprayer
Armed Forces Specialty Coatings
Self-Employed Painting Contractor
Powder Coater
Union Journeyman Painter
Interior Designer
Mural Artist Painter
Physical Plant Paint Foreman
Set Design
Color Consultant

Related Occupations for Painting & Design

Estimator
Facilities Management
Historical Preservation Specialist
Lead Paint Inspector
Real Estate Agent

Plumbing

Plumbing Exploratory
This course will give students a basic overview of the knowledge and skills required to pursue a career in the field of plumbing. They will be given an opportunity to solder copper, thread iron, and work with cast iron pipe systems. Students will learn how clean water supplies and sewage disposal systems affect the environment in which they live, both in ecological and health-related ways. Students will learn about the employment opportunities, wages, and career paths that are available to them should they choose to enter this field.

Plumbing Shop 1
The objective of this course is to expand the student's introduction to the plumbing trade based upon the fundamental skills acquired during the exploratory phase. The student will be introduced to the more technical aspects of the trade including pipe diagrams, math formulas, hand tool safety, and measurement. Projects will include drawing diagrams, measuring and cutting pipe, assembling pipe systems, and Shop safety. Students will receive a program orientation regarding expected behavior, tool requirements, and acceptable attire. Upon completion of this program, students will be prepared to enter Plumbing Shop 2.

Plumbing Shop 2
At this level, the students will learn how to navigate and learn basic codes of the Massachusetts Plumbing Code Book. Students will fabricate projects in all the materials used for water distribution, wastewater, venting, and gas projects. They will also work on material identification, sizes, selection of tools, and their uses. Shop safety is strongly emphasized at all times during this course.

Plumbing Shop 3
Students at this level are introduced to the layout and fabrication of practical projects such as bathrooms, kitchens, etc. Shop safety is emphasized at all times since the students are now working more independently. They are also introduced to repairing and maintaining plumbing systems including appliances, water heaters, and boilers. Practical application of Theory and plumbing codes are reinforced throughout the year using selected projects.

Plumbing Theory 3 (Tier I)
The objective of this course is to advance the student through Tier I, as set by the Massachusetts State Plumbing Board, as well as a series of written and oral examinations. Students will be able to identify vents, drains, and water pipes, as well as construction symbols in regard to the other trades. The student will be able to recognize by sight the different types of fittings, hangers, and pipes. Students will also be introduced to related physics and related drawing.

Plumbing Shop 4
Students at this level review the basics and then, with emphasis on safety, proceed with projects that will expand their skill in working with all types of pipes and fittings, fixtures, faucets, hot water heaters, tankless heaters, and gas appliances. All types of power and hand tools and various tricks of the trade are introduced. If sufficient opportunities exist and the students are eligible, seniors are encouraged to participate in the cooperative education work program. During this program, the student works in the field for a master plumber on their Shop

week, thereby gaining valuable, on-the-job experience. Most cooperative education jobs result in full-time employment opportunities upon graduation.

Plumbing Theory 4 (Tier II)
The objective of this course is to gradually advance the student through Tier II, as set by the Massachusetts State Plumbing Board and the plumbing Code Book, as well as a series of written and oral examinations. Student work covers glazed pipe, pipe fittings, drains, wastes, vents, plumbing fixtures, traps, water wells, water treatment, mains, services, pipe hangers, cross-connections, hot water, and gas. The student is introduced to related science and fabricates the plumbing system as described by the Plumbing Code Book.

Career Opportunities in Plumbing:

Entry-Level Occupations

Apprentice Gasfitter/License	Apprentice Plumber/License
Plumbing Supply Clerk	Stock Clerk

With Experience and/or Advanced Training

Designer-Plumber	Foreman
Journeyman Gasfitter/License	Journeyman Plumber
Master Plumber	Mechanical Engineer
Plumbing Contractor	Plumbing Estimator
Plumbing Inspector	Project Supervisor
Purchasing Agent	Sanitary Engineer
Teacher	Trade Guide Office

Related Occupations

Building Maintenance Person	Gas Company Worker
Hydraulic/Pneumatic Technician	Pipefitter
Pricing Clerk	Sprinkler Fitter

Veterinary Science

GREATER LOWELL TECHNICAL HIGH SCHOOL'S ABILITY TO OFFER VETERINARY SCIENCE IS DEPENDENT ON APPROVAL FROM THE MASSACHUSETTS DEPARTMENT OF ELEMENTARY AND SECONDARY EDUCATION (DESE). COURSE DESCRIPTIONS ARE SUBJECT TO CHANGE UPON APPROVAL.

Veterinary Science Exploratory
This course provides students with an introduction to the field of veterinary science, covering foundational concepts and skills essential for further study in the discipline. Students will explore the role of veterinary science in society, animal anatomy and physiology, basic animal care and husbandry principles, and safety protocols. Through hands-on activities and interactive learning experiences, students will gain insight into the diverse aspects of veterinary medicine, setting the stage for advanced coursework in the field.

Veterinary Science Shop 1
In Veterinary Science Shop 1, students will delve deeper into the practical aspects of veterinary medicine, focusing on the fundamental skills needed to continue in the field of study. Students will learn veterinary facility and animal safety fundamentals, including the proper use of personal protective equipment (PPE) and animal handling techniques. Additionally, students will explore basic animal husbandry and care practices, gaining proficiency in animal handling, nutrition, and reproduction. Students will complete the OSHA 10-hour safety course during Veterinary Science Shop 2.

Veterinary Science Shop 2
Building upon the foundation established in Veterinary Science Shop 1, this course further develops students' proficiency in veterinary facility management and communication. Students will learn how to effectively manage the day-to-day operations of a veterinary facility, including patient intake and discharge procedures, client communication, and inventory management. Emphasis will be placed on developing strong communication and client relations skills essential for successful interactions with clients, colleagues, and vendors. By mastering these competencies, students will be prepared for more advanced roles in veterinary practice.

Veterinary Science Shop 3
In Veterinary Science Shop 3, students will focus on advanced topics in veterinary science, including pharmacy and pharmacology, examination room procedures, and animal nursing. They will learn to identify common pharmaceutical materials and drugs used in veterinary medicine, understand proper storage and handling procedures, and adhere to safety regulations. Additionally, students will develop proficiency in examination room procedures, including patient identification, restraint methods, and basic exam techniques. Through hands-on practice, students will gain the skills necessary to assist with clinical procedures and provide quality care to animals in need.

Veterinary Science Theory 3
This theoretical course complements the practical skills learned in Veterinary Science Shop 3, giving students a deeper understanding of veterinary science principles and concepts. Students will study comparative animal anatomy and physiology, exploring the major body systems in small and large animals and their pathological conditions. They will also examine the role of veterinary science in society, focusing on animal rights, welfare, and ethical considerations. By integrating Theory with hands-on experience, students will develop a comprehensive understanding of veterinary medicine and its broader implications.

Veterinary Science Shop 4
In Veterinary Science Shop 4, students will advance their skills in surgical preparation and assisting, laboratory procedures, and radiography and imaging. They will learn to prepare for surgical procedures, assemble necessary equipment, and maintain a sterile operating environment. Additionally, students will gain proficiency in laboratory techniques, including parasite identification, equipment operation, and proper use of advanced PPE. Through hands-on training in diagnostic imaging methods, students will learn to implement safety measures and assist with completing diagnostic radiographs, CT scans, MRIs, and ultrasounds, preparing them for roles in veterinary diagnostics and surgery.

Veterinary Science Theory 4
This advanced theoretical course provides students a comprehensive understanding of veterinary science principles and practices. Students will explore complex topics such as pharmacology, animal nursing, and surgical procedures, gaining insight into the underlying mechanisms and principles governing veterinary medicine. Emphasis will be placed on critical thinking, problem-solving, and ethical decision-making as students analyze case studies and real-world scenarios. Integrating Theory with practical application will prepare students to excel in various veterinary science careers, from clinical practice to research and academia.

Career Opportunities in Veterinary Science:

Entry-Level Occupations

Veterinary Assistant
Farm Worker
Pet Groomer
Kennel Manager
Dog Trainer
Lab Animal Technician
Breeder

With Experience and/or Advanced Training

Veterinarian Technician
Animal Health Inspector
Zoologist
Marine Biologist
Animal Behaviorist
Research Laboratory Technician
Farm/Ranch Manager
Wildlife Biologist
Animal Nutritionist
Veterinarian

Related Occupations

Animal Control Officer
Microbiologist
Ecologist

Commonwealth Collegiate Academy (Engineering Pathway)

The Commonwealth Collegiate Academy (CCA) of the University of Massachusetts is designed to increase early college opportunities for high school juniors and seniors in partner schools, with a special emphasis on the matriculation of ethnically diverse, first-generation, economically disadvantaged, and under-served students. The CCA early college partnership will provide enrolled students with increased academic rigor, challenge, and an intensive introduction to university-level work to support a smoother transition into higher education. Students will have the opportunity to earn university credits while at the same time satisfying high school graduation requirements, spend time on a University of Massachusetts campus to engage in college awareness activities and learn more about career options and college majors.

Greater Lowell Technical High School has partnered with the University of Massachusetts Lowell to establish an Engineering Pathway within the Commonwealth Collegiate Academy. The Engineering Pathway is available to students in Computer Aided Drafting and Design, Electronics Engineering, and Engineering Technology.

Participation in CCA courses is offered to students upon grade-level attainment and teacher recommendation. The courses offered are intended to support students by accelerating the meeting of UMass Lowell degree requirements. More information can be found at: https://cca.massachusetts.edu/

The following courses are anticipated offerings but are subject to change:

PHIL.3340 Engineering and Ethics – Early College
https://www.uml.edu/catalog/courses/phil/3340
A philosophical analysis of the ethical dimensions and responsibilities of the engineering profession. Specific case studies and ethical issues are analyzed through the application of some of the basic concepts and principles of traditional and contemporary ethical theories. Meets Core Curriculum Essential Learning Outcome for Social Responsibility & Ethics (SRE).

MTEC.4140 Engineering Economics – Early College
https://www.uml.edu/catalog/courses/mtec/4140
This course introduces students to accounting and finance operations and principles, and how they impact engineering and manufacturing activities in both analytical and forward looking planning activities. Topics covered include financial statements, costing, depreciation, time value of money, cash flows, capital budgeting, and capital recovery with the objective of building working financial models for a technical environment.

PHIL.2070 Engineering and Society – Early College
https://www.uml.edu/catalog/courses/phil/2070
In this course, students will explore the nature of engineering as a practice, and consider the ways in which engineering interacts with and affects society in both local and global contexts. Students will approach these topics through philosophical methods, including reflection, dialogue, and critique. The goal of this course is to introduce students to practices of both philosophical inquiry and engineering and in so doing recognize the need for a holistic understanding of the interaction between society and technology.

CIVE.1070 Introduction to Engineering for Civil and Environmental – Early College
https://www.uml.edu/catalog/courses/CIVE/1070
This course provides an introduction to the elements of computer aided design using AutoCAD. Through assignments and projects, students learn various AutoCAD principles, i.e., graphic entities, hatch patterns, layering, and dimensioning, with special emphasis on completing a design project. Two-dimensional drafting and three-dimensional modeling and surface revolution are also discussed. This course is intended for freshmen in civil and environmental engineering majors.

Additional Technical Course Descriptions

AP Seminar – Advanced Placement

The Advanced Placement (AP) Seminar course supports students as they develop and practice the research, collaboration, and communication skills needed in academic and technical disciplines. Students will use the content of their chosen career and technical program to investigate various topics, including topics related to the student's areas of interest, write research-based essays, and design and give presentations individually and as part of a team. Specific skills to be developed include:

- Reading and analyzing articles, studies, and other texts related to their career and technical program
- Gathering and combining information from multiple sources
- Viewing an issue from multiple perspectives
- Crafting written and oral arguments based on evidence.

Student participation in the Advanced Placement (AP) Seminar is determined through consultation with the student's parent(s)/guardian(s), their technical teacher(s), and the counselor. Participation in the Advanced Placement (AP) Seminar could impact the number of hours gained during Shop and/or Theory.

If a student is not making adequate progress in an Advanced Placement (AP) course by the end of the first quarter, then a meeting with the student's parent(s)/guardian(s), teacher, and counselor will be required to develop a success plan for the student. The success plan may include a course change.

Academic Course Descriptions

English Language Arts

English 1 – Honors
English 1 Honors is a course designed to increase literacy using a variety of student-centered techniques. This survey course exposes students to a variety of literature including novels, dramas, short stories, poetry, speeches, and nonfiction texts to foster critical reading and writing skills. This course prepares students for college-level work. Purpose and coherence in paragraph and essay development in response to literature-based and text-based prompts are emphasized. Independent reading and the use of reference materials develop critical thinking and problem-solving skills through the development of questions and responses to questions posed in literary and nonfiction texts. Objectives of the course are developed to meet state testing requirements. The curriculum is aligned with the Massachusetts ELA Curriculum Frameworks.

English 1 – CP
English 1 – CP is a course designed to increase literacy using a variety of student-centered techniques. This survey course exposes students to a variety of literature including novels, dramas, short stories, poetry, speeches, and non-fiction texts. This course prepares students for college-level work. The course focuses on student development of skills in areas of oral and written communication, reading, researching and accessing information, critical thinking, problem-solving, responsibility, and collaboration. Objectives of the course are developed to meet state testing requirements. The curriculum is aligned with the Massachusetts ELA Curriculum Frameworks.

English 2 – Honors
The course aims to develop the necessary skills to meet the demands and expectations of typical college English courses. Using classic and contemporary selections from World Literature and a variety of genres including the novel, play, short story, dramas, poetry, and essay, students will engage in in-depth literary study, discuss common themes, and analyze literary techniques as well as the author's purpose. There is an emphasis on the development of students' oral and written reading responses and analysis skills. Vocabulary development, taught through numerous strategies, is text-based and focused on MCAS preparation. Independent reading and the use of reference materials help to strengthen students' ability to read and write effectively. The objectives of this course are developed to meet state testing requirements and the curriculum is aligned with the Massachusetts ELA Curriculum Frameworks.

English 2 – CP
This World Literature course emphasizes the development of reading, writing, speaking, and listening skills to build students' proficiency in English Language Arts and prepare them for both college and career readiness. Students continue to develop the reading, writing, note-taking, and discussion skills necessary for college study. The course focuses on a variety of genres including non-fiction, short stories, dramas, novels, and poetry. Vocabulary development, taught through numerous strategies, is text-based and focused on MCAS preparation. Independent reading and the use of reference materials help to build students' independence in learning. When writing about and discussing literature, making connections between current information and

instructional texts is emphasized. The objectives of the course and the course curriculum are aligned with the Massachusetts ELA Curriculum Frameworks and are developed to meet state testing requirements.

AP English Language and Composition – Advanced Placement
The Advanced Placement (AP) English Language and Composition course is comparable to an introductory college-level rhetoric and writing curriculum, which requires students to develop evidence-based analytic and argumentative essays that proceed through several stages of drafts. Students evaluate, synthesize, and cite research to support their arguments. Throughout the course, students develop a personal style by making appropriate grammatical choices. Additionally, students read and analyze the rhetorical elements and their effects in non-fiction texts, including graphic images as forms of text, from many disciplines and historical periods. Teacher recommendation is required for this course.

If a student is not making adequate progress in an Advanced Placement (AP) course by the end of the first quarter, then a meeting with the student's parent(s)/guardian(s), teacher, and the counselor will be required to develop a success plan for the student. The success plan may include a course change.

English 3 – Honors
This American Literature course aims to develop the necessary skills to meet the demands and expectations of typical four-year college courses. Increased complexity of writing assignments and enhanced sophistication of writer response are at the forefront of this course. Students will expand their ability to analyze and compose narrative, argument, and expositional forms as well as effectively and genuinely respond to authentic prompts. Using a variety of mentor texts, students will employ the writing process to develop and hone their composition skills. Whole-class novel studies will examine the complexities of humanity while excerpts from classic American Literature will trace the development of culture and society. Examination and analysis of essays, articles, plays, and short stories will foster critical reading and thinking skills. A rigorous self-selected reading unit allows each student to discover themselves as a reader. All curriculum is aligned to the Massachusetts ELA Curriculum Frameworks.

English 3 – CP
This American Literature course aims to develop the necessary skills to meet the demands and expectations for college and career readiness and focuses on English as a life-long tool for effective communication. Students will expand their ability to analyze and compose narrative, argument, and expositional forms as well as effectively and genuinely respond to authentic prompts. Whole-class novel studies will examine the complexities of humanity while excerpts from classic American Literature will trace the development of culture and society. Students will enhance their critical reading and thinking skills through a variety of both fiction and nonfiction texts. Each student will participate in independent reading, fostering their discovery as readers. All curriculum is aligned to the Massachusetts ELA Curriculum Frameworks.

English Composition I – Dual Enrollment
https://catalog.middlesex.mass.edu/preview_course_nopop.php?catoid=32&coid=32336
The course will provide three (3) credits at Middlesex Community College. English Composition I focuses on developing students' academic writing, close reading, and critical thinking skills. Using a writing process that includes pre-writing, drafting, instructor and peer feedback, and revision, students will produce written essays

with arguable thesis statements and appropriate use of standard English. Students will produce a total of 18-24 pages of formal polished writing in three or more source-based essays. Students must receive a 70 or better to receive college credit. Students will be responsible for the Middlesex Community College tuition to receive credits.
Prerequisites**:** Middlesex Community College requires students to submit a Multiple Measures sheet which includes the following criteria; a minimum of a 2.0 GPA; a minimum PSAT Reading score of 480, and junior teacher recommendation.

English Composition II – Dual Enrollment
https://catalog.middlesex.mass.edu/preview_course_nopop.php?catoid=32&coid=32337
The course will provide three (3) credits at Middlesex Community College. Building on skills learned in English Composition I, students will sharpen their academic writing, close reading, and critical thinking skills, as well as develop research skills. Using a writing process that includes pre-writing, drafting, instructor and peer feedback, and revision, students will produce thesis-driven, evidence-based essays that employ appropriate rhetorical strategies. In English composition II, students will be introduced to at least two documentation styles and will produce a total of 18-24 pages of polished formal writing in three or more source-based essays. Students must receive a 70 or better to receive college credit. Students will be responsible for the Middlesex Community College tuition to receive credits.
Prerequisites: Successful completion of English Composition I for Middlesex Community College credit.

AP English Literature and Composition – Advanced Placement
The Advanced Placement (AP) English Literature and Composition course is comparable to an introductory college-level literary analysis course. The course engages students in the critical analysis of imaginative literature to deepen their understanding of the ways writers use language to create meaning. Through a combination of class discussion and written analysis, students will consider a work's structure, style, and themes, as well as its use of figurative language, imagery, symbolism, and tone. Writing assignments include expository, analytical, and argumentative essays that require students to analyze and interpret literary works. Teacher recommendation is required for this course.

If a student is not making adequate progress in an Advanced Placement (AP) course by the end of the first quarter, then a meeting with the student's parent(s)/guardian(s), teacher, and the counselor will be required to develop a success plan for the student. The success plan may include a course change.

English 4 – Honors
This course prepares students for college and career-level work with a major focus on literature beginning with a study of Greek tragedy, Sophocles, and Oedipus Rex, the course then turns toward the year-long study of European literature. The students critically examine the relationship of theme and form with an in-depth study of Anglo-Saxon and Medieval literature, the Renaissance, the Restoration and Enlightenment, Romanticism, Victorian, and the age of Modernism. Writing skills are enhanced as students study the mechanics of writing, by developing a series of in-depth descriptive, narrative, and research papers. Students will complete a research project based on a thesis statement related to the themes of the course. The curriculum is aligned with the Massachusetts ELA Curriculum Frameworks.

English 4 – CP

Literature is a major focus in English 4 - CP, with an emphasis on college and career readiness. Beginning with a study of Greek tragedy, Sophocles and Oedipus Rex, the course then turns toward the year-long study of European literature. The students critically examine the relationship of theme and form with an in-depth study of Anglo-Saxon and Medieval literature, the Renaissance, the Restoration and Enlightenment, Romanticism, Victorian, and the age of Modernism. Writing skills continue to be developed, through a series of descriptive, narrative, and research papers. The curriculum is aligned with the Massachusetts ELA Curriculum Frameworks.

History/Social Sciences

United States History 1 – Honors
This content course covers American history from the American Revolution through the American Civil War. Students will study topics like the foundations of democracy, the French and Latin American Revolutions, manifest destiny, economics, and civics while making contemporary connections. Emphasis is placed on argumentative writing, analyzing primary sources, and cooperative learning. Students will develop these learning concepts through a combination of document-based questions, films, documentaries, and class discussions. The course curriculum is aligned with the Massachusetts History and Social Science Framework.

United States History 1 – CP
This content course covers American history from the American Revolution through the American Civil War. Students will study topics like the foundations of democracy, the French and Latin American Revolutions, manifest destiny, economics, and civics while making contemporary connections. Emphasis is placed on developing study and organizational skills, argumentative writing, analyzing primary sources, and cooperative learning. Students will develop these learning concepts through a combination of document-based questions, films, documentaries, and class discussions. The course curriculum is aligned with the Massachusetts History and Social Science Framework.

United States History 2 – Honors
The second year of U.S. history emphasizes the historical study of the United States following the Civil War and Reconstruction. Students will be guided through the late nineteenth century with a focus on the United States' shift from an agrarian economy to an industrial one, the progressive era, and the Civil Rights Movement of the twentieth century. Emphasis is placed on expository writing, close reading of fiction and nonfiction texts, analyzing primary sources, and cooperative learning. Students will develop these learning concepts through a combination of document-based questions, films, documentaries, and class discussions. Students will also participate in a Civics Project as a connection to various modern-day topics. The course curriculum is aligned with the Massachusetts History and Social Science Framework.

United States History 2 – CP
The second year of U.S. history emphasizes the historical study of the United States following the Civil War and Reconstruction. Students will be guided through the late nineteenth century with a focus on the United States' shift from an agrarian economy to an industrial one, the progressive era, and the Civil Rights Movement of the twentieth century. Emphasis is placed on developing study and organizational skills, expository writing, close reading of fiction and nonfiction texts, analyzing primary sources, and cooperative learning. Students will develop these learning concepts through a combination of document-based questions, films, documentaries, and class discussions. Students will also participate in a Civics Project as a connection to various modern-day topics. The course curriculum is aligned with the Massachusetts History and Social Science Framework.

World History – Honors
In this course, students will study the growth of Nationalism that led to the Age of Imperialism, and the cultural, economic, and political roots of the modern world. Additionally, students will study the 19th century reform

movements, The Great Depression, World War I, World War II, and the Cold War. Finally, students will examine self-determination movements throughout the 20th Century. Emphasis is placed on expository writing, close reading of non-fiction and fiction texts, project-based learning, and a survey of world geography. Students will accomplish the learning concepts of this course through the use of novels, document-based questions, films, documentaries, and discussion. The curriculum is aligned with the Massachusetts History and Social Studies Frameworks.

World History – CP
In this course, students will cover the growth of Nationalism that led to the Age of Imperialism, and the cultural, economic, and political roots of the modern world. Additionally, students will study the 19th century reform movements, The Great Depression, World War I, World War II, and the Cold War. Finally, students will examine self-determination movements throughout the 20th Century. Emphasis is placed on study and organizational skills expository writing, close reading of non-fiction and fiction texts, and a survey of world geography. Students will accomplish the learning concepts of this course through the use of novels, document-based questions, films, documentaries, and discussion. The curriculum is aligned with the Massachusetts History and Social Studies Frameworks.

Topics in World History – CP (3 Credit)
This course serves as a topical survey study of World History from the Age of Imperialism through to the end of the 20th Century. Students will examine the roots of revolutions in Europe and the Americas, 19th Century Reform Movements, The Great Depression, the World Wars, the Cold War, and Self-Determination movements throughout the 20th Century. Emphasis is placed on how these developments affect the current welfare and status of the United States and the world. The course will focus on study and organizational skills, expository writing, and the close-reading of non-fiction and fiction texts. The curriculum is aligned with the Massachusetts History and Social Studies Frameworks.

PSYC.101 Introduction to Psychological Science – Early College
https://www.uml.edu/catalog/courses/psyc/1010
An introduction course that focuses on application of the scientific method to major areas of psychology: biological, cognitive, developmental, social and personality, and mental and physical health. The course addresses the importance of social and cultural diversity, ethics, variations in human functioning, and applications to life and social action both within these areas and integrated across them. The research basis for knowledge in the field is emphasized.

PSYC.2600 Child and Adolescent Development – Early College
https://www.uml.edu/catalog/courses/psyc/2600 The developmental science of childhood and adolescence. Major theoretical perspectives, research methods, and ethical issues are presented with respect to prenatal development, infancy, childhood, adolescence, and the transition to adulthood. Empirical evidence for development in relevant contexts across biological, psychological, and social domains is examined. Prerequisites: PSYC.1010 Intro to Psychological Science

Introduction to Psychology – Hybrid (Honors or CP)
As the science of the human mind and behavior, the course will examine the different models upon which modern psychology has been built, along with such things as the history and origins of psychology, research methods, sensation and perception, mental health, sex and achievement, and psychological disorders through the study of the atypical mind.

This class will rely heavily on the Project Based Learning (PBL) model in order to connect the theoretical with the applicable. Such projects will include research methods practice, psychological experiments, and reflective writing through journaling.

As a hybrid class, there is a College Prep and Honors option. The content covered in this hybrid class will not be altered by the leveling chosen by the student. Rather the rigor of reading and assessment will be adjusted to meet the level chosen.

Mathematics

Algebra 1 – Honors
This is an intense course aligned closely with the Mathematics Curriculum Frameworks. It will cover number and quantity, algebraic expressions, polynomials, rational/irrational numbers, functions, linear, quadratic, and exponential models, and statistics/probability. Daily homework is required.

Algebra 1 – CP
This course focuses on the development of essential math skills. Algebra 1-CP is aligned with the Massachusetts Mathematics Curriculum Frameworks. Students will cover variables, inequalities, equation solving, real number properties, polynomials, and slope-intercept. In all areas, word problems are stressed.

Geometry – Honors
Honors Geometry covers the topics described in Geometry - CP but in greater detail. The course also includes an introduction to trigonometry and unit circle functions.

Geometry – CP
Geometry - CP is a study of angles, polygons, and circles based on the concepts of point, line, and plane. Students are provided opportunities to discover geometric concepts in a hands-on, experiential way using graphing, drawing, constructions, and more. Real-life models and applications also help students to apply and extend geometric concepts. Analytical and problem-solving skills are developed through the study of logic, visualization, and deductive proof.

Algebra 2 – Honors
This course covers Algebra 2 topics, including terminology, transformations, and operations on functions, rational functions, exponential and logarithmic functions, arithmetic and geometric sequences and series, and right triangle trigonometry and applications.

Algebra 2 – CP
Students will investigate linear, piecewise, absolute value, and quadratic functions. Additional topics of study will include and extensions of systems of equations and inequalities, polynomials, exponents, and radicals. Algebra 2 is aligned with the Massachusetts Math Curriculum frameworks.

MATH.1200 Precalculus Mathematics I – Early College
https://www.uml.edu/catalog/courses/math/1200
Intended for students whose background in basic algebra is current. Topics covered include: linear equations, slope of a line, quadratic equations, functions, transformations, inequalities, curve sketching, and systems of equations.

MATH.1230 Precalculus Mathematics II – Early College
https://www.uml.edu/catalog/courses/math/1230
A continuation of Math 1200. Covers exponential and logarithmic functions, trigonometric and inverse trigonometric functions, and trigonometric identities.
Prerequisites: A score of 80 or higher in MATH.1200 Pre-Calculus 1, or a score of 70 or higher in MATH.1200 Pre-Calculus 1, successful completion of Riverhawk Review (RHR) including a score of 80 or higher on the RHR final exam.

Precalculus – Honors
This course covers Pre-Calculus topics including triangle, circular and analytic trigonometry, exponential and logarithmic functions and equations, vector analysis, and analytic geometry. Students will be provided with TI-84+ CE that students will sign out for the year.

Precalculus – CP
This course is offered to students who have completed Algebra 2 - CP or higher who are recommended by their Algebra 2 - CP teacher. Pre-calculus prepares students for a study of Calculus, covering trigonometry, exponential and logarithmic functions and equations, vector analysis, and analytic geometry. Students will be provided with TI-84+ CE that students will sign out for the year.

AP Calculus AB – Advanced Placement
This course addresses all of the topics in Calculus – Honors as well as inverse trigonometric functions, differential equations, and slope fields. The course is intended to be the equivalent of a one-semester, college-level calculus course, which is taught over a full year in high school. This course culminates with the advanced placement exam that can earn college credit for the student. A recommendation is required for this course.

Calculus – Honors
This course addresses AP Calculus AB topics including limits, derivatives of elementary functions, partial fractions, integrals of elementary functions, and applications of differentiation and integration. Students will be provided with TI-84+ CE that students will sign out for the year.

AP Statistics – Advanced Placement
The AP Statistics course introduces students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. There are four themes evident in the content, skills, and assessment in the AP Statistics course: exploring data, sampling and experimentation, probability and simulation, and statistical inference. Students use technology, investigations, problem solving, and writing as they build conceptual understanding. The AP Statistics course is equivalent to a one-semester, introductory, non-calculus-based college course in statistics.

Probability and Statistics – CP
This course begins with a study of Descriptive Statistics and Graphical Displays, introducing students to Measures of Center and Spread as well as the various graphs used to visualize data (box plots, dotplots, histograms). This will be followed by looking at relationships in Bivariate data in two-way tables and scatter plots, including the correlation between variables. Students then move into an exploration of sampling and

comparing different types of studies. The study of basic probability rules follows, finishing with the Normal Distribution. Successful completion of Algebra 2 or above is a prerequisite for this course.

Physical Education/Wellness

Physical Education 9th

Freshmen will be offered a variety of team and individual activities, with an emphasis on fitness and skill development. Units are offered in fitness/weight training, cross country running, soccer, football, basketball, volleyball, speedball, and aquatics. Freshmen will also complete a fitness test to assess their individual fitness level.

Teen Health

This course addresses the adolescent years with a focus on overall wellness in the physical, mental/emotional, and social categories of health. Issues such as decision making, self-esteem, peer pressure, bullying, nutrition, fitness, smoking, alcohol, drugs, sexually transmitted infections, healthy relationships, and human sexuality are covered in this course. Emphasis is placed on decision making and choices resulting in a high quality of life. The curriculum includes classroom activities and discussions, as well as guest speakers from local community organizations.

Physical Education 10th

The High 5 Adventure course is the core of the sophomore curriculum. This course involves concepts taken from the High 5 Adventure Learning Center. The program also encourages critical thinking/brainstorming through our many group activities and low elements. Through our Full Value Contracts, which are developed by students and teachers, we emphasize the importance of respecting all individuals' opinions and beliefs. The outdoor rope course encourages skills such as taking initiative, problem-solving and group games. Sophomores also take swimming, CPR and First Aid. Students are required to write a reflection essay after the majority of project activities.

Physical Education Upper 1/ Physical Education Upper 2

Physical Education Upper 1 and Physical Education Upper 2 alternate years. The courses carryover and expand upon activities from Physical Education 9th. Activities include tennis, racquetball, volleyball, softball, floor hockey, jogging/walking, badminton, ping pong, fitness machines and weights, pickleball, golf, and aquatics.

Upper Health 1/Upper Health 2

Upper Health 1 and Upper Health 2 alternate years. The courses continue, and further, the curriculum of Teen Health. As with Teen Health, the primary focus is on overall wellness in the physical, mental/emotional, and social categories of health. Issues such as decision making, self-esteem, peer pressure, bullying, nutrition, fitness, smoking, alcohol, drugs, sexually transmitted infections, healthy relationships, and human sexuality are covered. Emphasis is placed on decision making and choices resulting in a high quality of life. The curriculum includes classroom activities and discussions, as well as guest speakers from local community organizations.

Science

Biology – Honors
This course increases the student's awareness of the living world. From atoms to cells, from DNA to proteins, from individuals to ecosystems, biology is the study of the intricate and complex systems that make life possible in almost every corner of our beautiful planet Earth. The purpose of this course is to give students a better understanding and appreciation of the wonders of life in and around them. Students will participate in classroom and laboratory experiences that deepen their understanding of the fundamental processes of life, the structure and function of different organisms, and how living things coexist and impact one another. Students will be challenged to explore how life works at the cellular and systemic level, to analyze the role of DNA in living things and the impact of biotechnology on our world, and to consider both the unity and diversity of organisms in the biosphere. All ninth-grade students are expected to take the Biology MCAS at the end of the course. This course has been aligned with the Massachusetts Science Curriculum Frameworks.

Biology – CP
This course provides a concept-based overview of biological principles. From atoms to cells, from DNA to proteins, from individuals to ecosystems, biology is the study of the intricate and complex systems that make life possible in almost every corner of our beautiful planet Earth. The goal of this course is for students to make meaningful connections to the curriculum and gain a general understanding of the basic biology concepts through laboratory experiments, group activities, interactive technology activities, projects, and classroom work. All ninth-grade students are expected to take the Biology MCAS at the end of the course. This course has been aligned with the Massachusetts Science Curriculum Frameworks.

Biology 2 – CP
This course provides a comprehensive coverage of biological principles and their application to real living organisms. Topics include the chemistry of life, cell structure and function, genetics, evolution, biodiversity, human anatomy, and physiology. The objective is that the students will gain a thorough understanding of how living things function and interact with their environment. This will be done through laboratory experiments, group activities, interactive technology activities, projects, and classroom work. Students enrolled in Biology 2 - CP are expected to take the Biology MCAS after the first half of the course. This course has been aligned with the Massachusetts Curriculum Frameworks.

PLTW (Project Lead The Way) Principles of Biomedical Science – CP
This course, designed for students who have taken a year of Biology, is run in partnership with PLTW, a leading K-12 applied learning STEM curriculum and training provider. In this course, students explore concepts of biology and medicine as they take on the roles of different medical professionals to solve real-world problems. Throughout the year, students are challenged in various scenarios, including investigating a crime scene to solve a mystery, diagnosing and proposing treatment to patients in a family medical practice, and how viruses and bacteria evolve in our lives.

Completion of PLTW courses could translate to undergraduate credit at colleges and universities. Students and families should research which higher education institutes offer credit and how credit can be earned.

PLTW (Project Lead The Way) Medical Interventions – CP
In this course, offered by PLTW, students will investigate a variety of interventions involved in the prevention, diagnosis, and treatment of disease as they follow the lives of a fictitious family. The course is a "how-to" manual for maintaining overall health and homeostasis in the body as students explore how to prevent and fight infection, how to screen and evaluate the code in human DNA, how to prevent, diagnose, and treat cancer, and how to prevail when the organs of the body begin to fail. These scenarios expose students to various interventions related to immunology, surgery, genetics, pharmacology, medical devices, and diagnostics. Interventions may range from simple diagnostic tests to the treatment of complex diseases and disorders. These interventions are showcased across generations of a family and provide a look at the past, present, and future of biomedical sciences. Lifestyle choices and preventive measures are emphasized throughout the course, as are the important roles scientific thinking and engineering design play in the development of interventions of the future.

Completion of PLTW courses could translate to undergraduate credit at colleges and universities. Students and families should research which higher education institutes offer credit and how credit can be earned.

AP Environmental Science – Advanced Placement
AP Environmental Science is a laboratory and field-based course designed to provide students with the content and skills needed to understand the various interrelationships in the natural world, to identify and analyze environmental problems, and to propose and examine solutions to these problems. The course is intended to be the equivalent of a one-semester, college-level ecology course, which is taught over a full year in high school. The course encompasses human population dynamics, interrelationships in nature, energy flow, resources, environmental quality, human impact on environmental systems, and environmental law. A recommendation is required for this course.

Environmental Science – CP
This comprehensive two-semester course offers compelling lessons that cover many aspects of the field including population ecology, human impacts on the environment, climate change, and pollution as well as Earth's systems and resources, soil chemistry, water and land use, and types of energy. Environmental science is a captivating and rapidly expanding field. Through unique activities and material, high school students connect scientific Theory and concepts to current, real-world dilemmas, providing them with opportunities for mastery in each of the segments throughout the year. Laboratory work is an important part of this course.

CHEM.1210 Chemistry 1 with CHEM.1230l Lab – Early College
https://www.uml.edu/catalog/courses/chem/1210
Provides an introduction to the basic concepts of chemistry through classroom discussions and demonstrations. Topics include chemical calculations, atomic structures, the periodic table, basic bonding Theory, solutions, liquids, and gases. Restricted to science, health science, engineering, and engineering technology majors.

https://www.uml.edu/catalog/courses/chem/1230l
Studies experimental chemical principles and chemical transformation that is coordinated with topics considered in CHEM.1210. Some of the more important reactions of elements, oxides, acids, bases, and salts are examined. Other topics include chemical separation, purification, preparation of inorganic salts, quantitative determinations

dealing with the formula of a compound, gas laws, and colligative properties. Careful techniques and precise measurements are stressed. Restricted to science, engineering, and engineering technology majors

Chemistry – Honors
This course can be taken in the sophomore, junior, or senior year. This course is designed for students who have completed Biology and have passed the Biology MCAS. Detailed investigations require independent inquiry and problem-solving along with communication of findings in the form of writing. Topics include the atomic structure, periodic table, types of reactions, stoichiometry, gas laws, and solution-based reactions. This course is aligned with the Massachusetts Curriculum Frameworks. Laboratory work is an important part of this course.

Chemistry – CP
This course can be taken in the sophomore, junior, or senior year. The course covers the general aspects of chemistry including concepts and patterns in the periodic table, atomic structure, balancing chemical equations, elements, compounds, and mixtures. Students will conduct a series of chemical experiments using environmentally friendly substances. Laboratory work is an important part of this course.

Anatomy & Physiology – Honors
Anatomy and Physiology - Honors is an in-depth study of the structure and function of the human body. Students enrolled in the course will learn anatomy and physiology through lectures, hands-on experiments, dissection, and video presentations. Dissection of a sheep heart, brain, and fetal pig are part of the standard laboratory experience for this course; alternative activities are available upon written request by parent/guardian. Students will also be required to contribute to their learning experience by participating in class projects and performing presentations. Laboratory work is an important part of this course.

Anatomy & Physiology/PLTW (Project Lead The Way) Human Body Systems – CP
This course provides a comprehensive, hands-on exploration of the human body's structures and functions through engaging, lab-based activities. Students design and conduct experiments, use advanced data acquisition tools to monitor physiological functions such as muscle movement and respiration, and solve real-world biomedical cases. Activities include building anatomical models, investigating medical mysteries, and dissecting animal tissues like sheep brains, hearts, and fetal pigs to deepen understanding of complex systems. Offered in partnership with Project Lead The Way (PLTW), this course emphasizes scientific rigor and critical thinking, fostering higher academic achievement and comprehension.

Completion of PLTW courses could translate to undergraduate credit at colleges and universities. Students and families should research which higher education institutes offer credit and how credit can be earned.

AP Biology – Advanced Placement
AP Biology is an introductory college-level biology course. Students cultivate their understanding of biology through inquiry and laboratory-based investigations as they explore the following topics: evolution, cellular processes — energy and communication, genetics, information transfer, ecology, and interactions. The course is based on four Big Ideas, which encompass core scientific principles, theories, and processes that cut across traditional boundaries and provide a broad way of thinking about living organisms and biological systems. The

course is intended to be the equivalent of a two-semester, college-level biology course, which is taught over a full year in high school. A recommendation is required for this course.

AP Physics 1 – Advanced Placement
The AP Physics 1 course focuses on the big ideas typically included in the first semester of an algebra-based introductory college-level physics sequence and provides students with enduring understandings to support future advanced course work in the sciences. Through inquiry-based learning, students will develop critical thinking and reasoning skills, as defined by the AP Science Practices. Topics covered will include kinematics, dynamics, energy, momentum, circular motion, gravitation, and rotation.

Physics – Honors
A course in introductory physics is intended to teach the way the physical world in which we live works. The focus of this course is two-fold: the investigation of a variety of physics topics and the development of skills in experimentation and problem-solving. Topics include linear and projectile motion, forces and dynamics (in 2 dimensions), gravity, momentum, mechanical energy, thermal energy and heat transfer, sound and light waves, and electromagnetism. In this science course, students will develop problem-solving skills, be asked to investigate and explain several phenomena, and present data based on experiments. Emphasis is placed on logical thinking, problem-solving, and basic algebra skills. Basic knowledge of trigonometry is recommended.

Physics – CP
A course in introductory physics is intended to teach the way the physical world in which we live works. The focus of this course is two-fold: the investigation of a variety of physics topics and the development of skills in experimentation and problem-solving. Topics include linear motion, forces and dynamics, gravity, momentum, mechanical energy, thermal energy and heat transfer, sound and light waves, and electromagnetism. In this science course, students will develop problem-solving skills, be asked to investigate and explain several phenomena, and present data based on experiments. Emphasis is placed on logical thinking, problem-solving, and basic algebra skills. Algebra 1 is a prerequisite.

Environmental Science 1 – A Living World in Transition – CP (3 Credit)
Offered alternating years, this course serves as a topical survey of environmental science focusing on the living world including population ecology, human impacts on the environment, climate change, and pollution. Environmental science is a captivating and rapidly expanding field. Through unique activities and material, high school students connect scientific Theory and concepts to current, real-world dilemmas, providing them with opportunities for mastery in each of the segments throughout the year. Laboratory work is an important part of this course.

Environmental Science 2 – Earth's Scarce Resources – CP (3 Credit)
Offered alternating years, this course serves as a topical survey of environmental science focusing on Earth's systems and resources, soil chemistry, water and land use, and types of energy. Environmental science is a captivating and rapidly expanding field. Through unique activities and material, high school students connect scientific Theory and concepts to current, real-world dilemmas, providing them with opportunities for mastery in each of the segments throughout the year. Laboratory work is an important part of this course.

Academic Support

English Language Education – Basic
This course is designed to increase each student's fluency with the English language in order to build their academic proficiency. Opportunities are provided for students to listen, speak, read and write English so that they can function more independently in school and in the community. Emphasis is placed on reading comprehension, vocabulary development, and responding to text-based questions to prepare for the state testing requirements. Students are introduced to the writing process and practice editing and proofreading. Language instruction and course texts are aligned with the World-Class Instructional Design and Assessment (WIDA).

English Language Education – Intermediate
This course is designed to increase each student's fluency in listening, speaking, reading, and writing English, and to build skills that support overall achievement in academic and technical classes through reading and responding to leveled texts. Written responses to text-based questions prepare students for state testing requirements. Language and vocabulary are developed through oral and written assignments. Language instruction and course texts are aligned with the World-Class Instructional Design and Assessment (WIDA).

English Language Education – Advanced
This course is designed to prepare the students to succeed independently in academic and technical classes. Instruction utilizes academic and technical class texts and introduces research skills. Advanced grammar instruction encourages students to incorporate knowledge of various sentence structures into their essay writing to improve clarity of expression. Language instruction and course texts are aligned with the World-Class Instructional Design and Assessment (WIDA).

Essential Concepts of English
Essential Concepts of English is designed to provide support to students who have not passed the English Language Arts MCAS exam. An emphasis will be placed on test-taking skills and key standards from the Massachusetts ELA Curriculum Frameworks.

Essential Concepts of Math
Essential Concepts of Math is designed for students who have not passed the math MCAS exam. A variety of learning methods are utilized to increase student understanding of the key concepts identified in the Massachusetts Mathematics Curriculum Frameworks. Test-taking skills will also be emphasized.

Algebra Foundations
Algebra Foundations is a supportive, skills-based course designed to help students develop confidence and proficiency in key algebraic concepts. This course provides personalized instruction, practice opportunities, and connections to current math content to strengthen foundational understanding. Interactive technology and small-group supports are utilized to enhance the learning experience. Placement is based on individual learning needs and current math performance.

Geometry Foundations
Geometry Foundations is designed to support students as they build essential skills and confidence in geometric concepts. The course emphasizes foundational understanding through personalized instruction, hands-on activities, and structured practice to prepare students for success. Placement is determined based on student learning needs and performance in prior coursework.

Readers/Writers Workshop A
The primary emphasis of this course is to improve each student's ability to communicate effectively through the use of strategic reading, writing, speaking, and listening skills. Instruction is tailored to students' individual learning needs, based on a variety of assessments, and includes extended learning time. The goal is to provide students opportunities to increase motivation, independence, and transfer of literacy skills to their academic, professional and personal lives. Freshmen who obtain a Lexile level of 430 or below on the Star Reading assessment will be placed in this class.

Readers/Writers Workshop C
The primary emphasis of this course is to improve each student's ability to communicate effectively through the use of strategic reading, writing, speaking, and listening skills. Instruction is tailored to students' individual learning needs, based on a variety of assessments, and includes extended learning time. The goal is to provide students opportunities to increase motivation, independence, and transfer of literacy skills to their academic, professional and personal lives. Freshmen who obtain a Lexile level of 430 to 800 on the Star Reading assessment will be placed in this class.

Readers/Writers Workshop E
The primary emphasis of this course is to improve students' abilities to communicate effectively through the use of strategic reading, writing, speaking, and listening skills. Instruction is tailored to students' individual learning needs, based on a variety of assessments. Students are placed in Readers/Writers WorkShop E as the result of the Star Reading assessment if their Lexile levels are between 800 and 950. Freshmen students placed in this class will work to bring their reading and writing skills as close to or above grade level expectations in one year.

Readers/Writers Workshop D
This course builds on the foundation of Reader/Writers WorkShop A and C with continued opportunities for students to deepen knowledge and improve skills in reading and writing, speaking, and listening. Instruction is tailored to students' individual learning needs. Students in Readers/Writers WorkShop A and C who score below 990L on the final benchmark assessment take Readers/Writers WorkShop D as sophomores.

Study Skills
Determination of need for the Study Skills class is based upon decisions made at the student's Individualized Education Plan (IEP) team meeting. Students in need of academic support and continued development of independent work habits are assigned to Study Skills. In Study Skills, students focus on strategies to improve their organization, planning of coursework and assignments, as well as reinforcement of concepts taught, test preparation, note-taking, time management, and self-advocacy skills.

Transitional Occupations Program

The Transitional Occupations Program is a specially designed academic program offering functional academic courses and a specialized vocational training experience. The program is designed for students with significant cognitive/intellectual disabilities as determined through the Team meeting process. The primary goal of the TOPs program is to provide students with the necessary employability skills to work independently as an adult in the community.

Functional English Language Arts
Functional English Language Arts is designed to improve each student's reading, writing, vocabulary, speaking, listening, and critical thinking skills. The curriculum is aligned with the Massachusetts Curriculum Frameworks. The focus is on exposing students to a variety of high-interest literature that includes novels, short stories, plays, and poetry. The development of vocabulary is supported by the use of selected reading materials. This course is designed to fulfill the requirements of the MCAS Alternate Assessment portfolios.

Transitional Occupations Reading and Literature
The primary emphasis of Transitional Occupations Reading and Literature is to improve each student's ability to communicate effectively through the use of strategic reading, speaking, and listening skills. Students read and respond to relevant and developmentally appropriate materials independently and in group settings. Instruction is tailored to the student's individual learning needs and is based on a variety of assessments. The goal is to provide students opportunities to increase motivation, independence, and transference of literacy skills to their academic, professional, and personal lives.

Functional Mathematics
Functional Mathematics focuses on the mathematics that students need for everyday life (time, money, use of a calculator, etc.) The 10^{th} grade curriculum also introduces Geometry, Algebra, and number sense in order to fulfill the requirements of the MCAS Alternate Assessment portfolios.

Functional Science
Functional Science is a standards-based curriculum that focuses on ecosystems and other aspects of the Biology Frameworks. This course is designed to fulfill the requirements of the MCAS Alternate Assessment portfolios.

Functional Health
Functional Health teaches fundamental health concepts, promotes habits and conduct that enhance health and wellness, and guides efforts to build healthy families, relationships, schools, and communities.

Adolescent Issues
Adolescent Issues teaches fundamental health concepts, promotes habits and conduct that enhance health and wellness, and guides efforts to build healthy families, relationships, schools, and communities.

Self-Advocacy/Awareness
Self-Advocacy/Awareness is designed to help students with disabilities build independence in school and into adulthood. The curriculum focuses on teaching students to be assertive, know their rights, and resolve conflicts.

Students learn ways to effectively express their feelings, utilize coping strategies, and handle and react to bullying. Students participate in lessons that will assist them in the transition from school to employment.

Career Awareness

Career Awareness prepares students for the world of work. Students will set short term and long-term career goals, and learn how to make informed decisions about the future. Teaching also focuses on vocational options, student specific interests, and personal strengths. Students are taught about job expectations, career planning, and time management.

Transitional Training

The Transitional Training curriculum is a Massachusetts CVTE Standards-aligned course that focuses on providing students with hands-on skills to be career-ready. The curriculum includes content in the Culinary Arts field, CVS/retail fields, TOPs Prints printing and design field and/or Greenhouse/Landscaping field with focuses on communication in the workplace, and demonstration of active listening skills.

Transitional Occupations Theory

The Transitional Occupations Theory curriculum focuses on providing students with general knowledge and skills to be career-ready. The curriculum includes career exploration, job searching skills, communication in the workplace, demonstration of active listening skills, work ethic, and professionalism. The curriculum focuses on employability and career readiness knowledge and skills.

Appendix A: Admission Policy

1. Admissions Introduction

   Massachusetts state regulations (603 CMR 4.00) require all state-funded career/vocational technical education (CVTE) schools and CVTE programs at public high schools to develop and implement admissions policies that comply with state and federal law, as well as relevant guidelines issued by the Massachusetts Department of Elementary and Secondary Education and the U.S. Department of Education.

   An admissions process, intended to comply with Massachusetts state regulations is necessary in vocational technical schools where space is a limiting factor. Vocational technical laboratories (Shops) are designed and equipped to serve a specific maximum number of students safely. Consequently, a complex of such laboratories lacks both the space and flexibility to accommodate the possible needs and/or interests of all applicants. Therefore, a selection process is necessary. All applicants to grades 9, 10, 11, and 12 at Greater Lowell Technical High School (GLTHS) will be evaluated using the criteria contained in this Admission Policy.

   When Greater Lowell Technical High School receives more applications than it has available seats, GLTHS applies selection criteria to determine which students it will admit.

   The criteria Greater Lowell Technical High School applies have been approved by the GLTHS School Committee on November 21, 2024, and the School Committee will approve the use of these criteria annually. The Greater Lowell Technical High School admission policy is on file at the Department of Elementary and Secondary Education.

2. Equal Educational Opportunity

   Greater Lowell Technical High School does not discriminate on the basis of race, color, religious creed, national origin, limited English proficiency, sex, sexual orientation, age, gender identity, criminal record, disability, veteran status, genetic information, pregnancy or a condition related to said pregnancy, and homelessness in the administration of its educational and employment policies, programs, practices or activities, as defined and required by state and federal law. In addition, Greater Lowell Technical High School is committed to providing a work and learning environment free from sexual harassment and prohibits retaliation against any individual for making a complaint of conduct prohibited under this Notice, or for assisting in the investigation of such a complaint.

   If a student's primary home language is not English, Greater Lowell Technical High School will provide them with an application form in their home language. Please contact our Admissions Office at (978) 441-4951, admissions@gltech.org if you have questions or need help completing the application form.

   Greater Lowell Technical High School is committed to providing educational opportunities to students experiencing homelessness. Educational stability has a lasting impact on students' academic achievement and wellbeing, and the School Committee is committed to supporting district and community efforts to ensure students experiencing homelessness and in foster care, and military children have access to high-quality, stable educational practices. Please contact the McKinney Vento Homeless Liaison/Foster

Care/Military Liaison Tracy Encarnacao at tencarnacao@gltech.org, (978) 441-4955, Fax (978) 441-5399 and 250 Pawtucket Blvd., Tyngsborough, MA 01879 with any questions.

Students with disabilities may voluntarily identify themselves to Greater Lowell Technical High School to request reasonable accommodations during the application and admission process.

Neither a student's disability nor the primary language of their home will have any effect on their admission to Greater Lowell Technical High School.

Consistent with Massachusetts regulations, Greater Lowell Technical High School has created a plan with deliberate, specific strategies to promote equal educational opportunities and attract, enroll, and retain a student population that, when compared to students in similar grades in sending districts, has a comparable academic and demographic profile.

3. Eligibility

Resident Students:

Any 8th, 9th or 10th grade student who is a resident of the Greater Lowell Regional Vocational School District (Dracut, Dunstable, Lowell, Tyngsborough) who expects to be promoted to the grade they seek to enter by their local district is eligible to apply for fall admission or admission during the school year, subject to the availability of openings to Greater Lowell Technical High School. Resident students will be evaluated using the criteria contained in this Admission Policy.

Students may only be admitted to Greater Lowell Technical High School if they have been promoted to the grade they are seeking to enter. Students should be aware that their admission is conditional—if they are not ultimately promoted to enter the grade they have applied for, their admission will be rescinded. Greater Lowell Regional Vocational School District resident students who meet the minimum requirements for admission shall be admitted prior to acceptance of any non-resident students according to the District Agreement.

School Choice/Non-Resident Students:

Greater Lowell Technical High School does participate in the inter-district school choice program. The inter-district school choice program, M.G.L. c. 76, § 12B, allows parents/guardians to send their children to schools in communities other than the city or town in which they reside.

Students who are not residents of Greater Lowell Regional Vocational School District (Dracut, Dunstable, Lowell, Tyngsborough) are eligible to apply for fall admission to Greater Lowell Technical High School as a school choice student or a nonresident student subject to the availability of openings to Greater Lowell Technical High School.

Students may only be admitted to Greater Lowell Technical High School if they have been promoted to the grade they are seeking to enter. Students should be aware that their admission is conditional—if they are not ultimately promoted to enter the grade they have applied for, their admission will be rescinded.

Nonresident students from other vocational technical schools are eligible to apply for fall admission or admission during the school year to grades 9, 10, 11, and 12 at Greater Lowell Technical High School provided they expect to be promoted to the grade they seek to enter by their current school. Nonresident

students under (Chapter 74) will be evaluated using the criteria contained in this Admission Policy. 603 CMR Section 4.03(6)(b): Non-resident students shall submit an **application of admission** to the receiving school no later than **March 15th** of the preceding school year and shall be subject to the admissions criteria of the receiving school. A non-resident student must submit the **Chapter 74 Vocational Technical Education Program Non-resident Student Tuition Application** to the district of residence no later than **April 1** of the preceding school year. If a student moves to a non-resident district after April 1, the student shall submit a new Chapter 74 Vocational Technical Education Program Non-resident Student Tuition Application to their district of residence as soon as practicable.

Please be aware that residents of Greater Lowell Regional Vocational School District (Dracut, Dunstable, Lowell, Tyngsborough) who meet the minimum admission requirements will be admitted before any non-residents. School choice students and nonresident students will be evaluated using the criteria contained in this Admission Policy.

Students and families can find information on the Chapter 74 Nonresident Student Tuition Program online.

Transfer Students:

Transfer students from other Chapter 74 state-approved vocational technical education programs, who relocate away from their current school into the Greater Lowell Regional Vocational School District (Dracut, Dunstable, Lowell, Tyngsborough) **and wish to pursue the same program of study at Greater Lowell Technical High School**, are eligible to apply for fall admission or admission during the school year to grades 9, 10, 11, or 12 at Greater Lowell Technical High School.

Students may only be admitted to Greater Lowell Technical High School if they have been promoted to the grade they are seeking to enter. Students should be aware that their admission is conditional—if they are not ultimately promoted to enter the grade they have applied for, their admission will be rescinded.

Transfer students will be considered on a space available basis and will be evaluated using the criteria contained in this Admission Policy.

Homeschooled Students:

Homeschool applicants may apply for admission to Greater Lowell Technical High School including admission during the school year, provided all Admission Policy criteria are followed where applicable. The Home School students' parent(s)/guardian(s) must submit a copy of the Home School approval letter from the local school superintendent and verifiable grades supported by a portfolio of the student's grade-level body of work in English Language Arts, Mathematics, Science, and Social Studies or their equivalent. A letter from the local superintendent attesting to the attained grade level may be requested.

Students may only be admitted to Greater Lowell Technical High School if they have been promoted to the grade they are seeking to enter. Students should be aware that their admission is conditional—if they are not ultimately promoted to enter the grade they have applied for, their admission will be rescinded.

Online School Students:

Online school applicants may apply for admission to Greater Lowell Technical High School including admission during the school year, provided all Admission Policy criteria are followed where applicable.

The Online School students' parent(s)/guardian(s) must submit verifiable grades supported by a portfolio of the student's grade-level body of work in English Language Arts, Mathematics, Science, and Social Studies or their equivalent. A letter from the local superintendent attesting to the attained grade level may be requested. Students may only be admitted to Greater Lowell Technical High School if they have been promoted to the grade they are seeking to enter. Students should be aware that their admission is conditional—if they are not ultimately promoted to enter the grade they have applied for, their admission will be rescinded.

McKinney - Vento:

If homeless students are unable to provide written proof of their shelter or temporary residence in the district, the homeless liaison will work with the family seeking enrollment to determine homelessness eligibility. Upon determining that the student is homeless, the school shall immediately enroll the student pursuant to district policies without the other typical required documentation such as immunizations.

Foster Care Students:

The law requires that foster care students continue to attend their school of origin, unless after a collaborative decision-making process it is determined to be in the students' best interest to enroll in and attend school in the district in which a foster care provider is located (if different). To minimize disruption of the student's education, the law requires that the district enroll the student in the new school immediately. The McKinney Vento-Homeless/Foster Care liaison will contact the student's school or origin immediately to obtain relevant records and documentation.

Military Students:

In an effort to facilitate placement and enrollment for students transferring into or out of the districts because of their parents/guardians being on active duty in the U.S. Armed Services, the District will support and implement its responsibilities as outlined in the Interstate Compact on Educational Opportunity for Military Children.

4. Organizational Structure

Greater Lowell Technical High School is a New England Association of Schools and Colleges (NEASC) accredited public regional vocational technical school located on a scenic 72-acre campus located on the Tyngsborough/Lowell line, in Tyngsborough, Massachusetts. Greater Lowell Technical High School is a member of the Greater Lowell Regional Vocational School District that serves the four communities of Dracut, Dunstable, Lowell, and Tyngsborough. Greater Lowell Technical High School is committed to providing quality vocational technical programs.

The Superintendent-Director of Greater Lowell Regional Vocational School District is:

Jill Davis, jdavis@gltech.org*, (978) 441-4800*

The Assistant Superintendent/Principal of Greater Lowell Regional Vocational School District is:

Michael Barton, mbarton@gltech.org*, (978) 441-4807*

The Director of Technology, Enrollment, and Information of Greater Lowell Regional Vocational School District is:

Lisa Martinez, lmartinez@gltech.org*, (978) 441-4948*

It is the responsibility of Greater Lowell Regional Vocational School District Superintendent-Director to supervise the administration of the policies and procedures used to admit and enroll students, consistent with all applicable laws, regulations, and guidance.

Greater Lowell Technical High School has an admissions committee appointed by the Superintendent-Director. The committee is chaired by the Director of Technology, Enrollment and Information and includes the Director of School Counseling, Director of Special Education, Director of Language Acquisition, Director of Curriculum, Instruction, and Assessment and admissions staff. Responsibilities of the Admission Committee include:

1. Review of admissions data from current and previous school years and all relevant data regarding our sending communities to ensure equitable access pursuant to 603 CMR 4.00 and all applicable state and federal regulations.
2. Determination of standards for admission.
3. Development and implementation of admission procedures.
4. Processing of applications.
5. Ranking of students.
6. Acceptance of students according to the procedure and criteria in the admission policy.
7. Establishment and maintenance of waitlist of acceptable candidates.

5. Admissions Communication Policies

The Director of Technology, Enrollment and Information and The Director of School Counseling are responsible for disseminating information about Greater Lowell Technical High School through local school tours, presentations, and press releases, and for collecting applications and necessary official enrollment documents from the local schools. Admissions, resources, and promotional materials will be made available in the student/family's home language whenever possible.

Greater Lowell Technical High School maintains a calendar of events on its website http://www.gltech.org where it provides information on the admissions process, a link to our online application, as well as other information about its programs. Students and their families can request hard copies of the calendar by calling or emailing the Admissions Office at (978) 441-4951, admissions@gltech.org.

Greater Lowell Technical High School also shares recruitment information, in several languages, with potential applicants in the following ways:

a. Greater Lowell Technical High School offers tours of its facilities to interested applicants. Visitations of District eighth-grade students to Greater Lowell Technical High School are scheduled when possible with sending schools from October through December of each year. To request a tour, please call or email our Admissions Office at (978) 441-4951 or admissions@gltech.org.
b. Presentations at the sending schools are scheduled throughout the year at the request of the

sending school.

c. An Open House is scheduled during the winter of each year. Prospective students and their parent(s)/guardian(s) have an opportunity to visit all vocational-technical programs, speak with vocational and academic teachers and school counselors, and view a presentation about all offerings.
d. Brochures and videos that describe application processes and vocational-technical programs including academic courses, athletics, cooperative education, English Language Education (ELE), and special education resources are distributed during the eighth-grade visitations, the Open House, and through local school counseling offices and community centers.
e. A copy of the approved Admissions Policy and Program of Studies will be posted annually on the school website and will be provided in hard copy or electronically upon request.

If the agreed-upon time slot for a tour occurs during the applicant's school day, the Admissions Office will provide confirmation to the applicant's current school that the applicant attended a tour during this time. Such tours may not be counted as unexcused absences by sending districts. Transportation is provided for all chaperoned sending school tours provided they are scheduled during the school day.

6. Application Process

APPLICATION PROCESS FOR FALL ADMISSION TO THE NINTH, TENTH, ELEVENTH, AND TWELFTH GRADE

1. Students interested in applying to Greater Lowell Technical High School for fall admission to the 9th, 10th, 11th, or 12th grade (if applicable) must:

    a. Complete and submit an electronic application through our website or print an application from our website at http://www.gltech.org/admissions, obtain an application from their local school counselor, or contact the Admissions Office at admissions@gltech.org, (978) 441-4951 to request a paper application as early in the school year as possible. Applications are offered in student/family's home language.
    b. Applications for Grade 9 Fall Admission must be submitted either electronically or by paper copy to Greater Lowell Technical High School by the priority admission deadline of February 3, 2025. Applications for Grades 10, 11, and 12 (if applicable) need to be submitted by the end of the school year.

2. It is the responsibility of the local school counselor to:

    a. Upon notification that a student has applied, complete and submit their portion of the application, including required signatures to the Greater Lowell Technical High School Admissions Office on or before February 3, 2025. If a late application is submitted after February 3, 2025, the sending school counselor/staff should complete and submit their portion of the application, including required signatures, to the Greater Lowell Technical High School as soon as possible.
    b. Complete applications include:
        (i) Completed application form (including required signatures), official school record of grades, attendance, and discipline.
        (ii) For application to grade 9 (fall admission), the final grades for grade 7 and 1st

and 2nd Quarter/Trimester grades for grade 8 in English Language Arts, Mathematics, Science, and Social Studies or course equivalent from the local school report card/transcript are required.

For application to grades 10, 11, and 12 (fall admission if applicable), the final grades of the previous two school year's grades in English Language Arts, Mathematics, Science, and Social Studies or course equivalent from the local school report card/transcript are required.

For application to grade 9 (fall admission), the sum of grade 7 and 1st and 2nd Quarter/Trimester grade 8 unexcused absences from the local school report card/transcript are required.

For application to grades 10, 11, and 12 (fall admission if applicable), the sum of the previous two school year's unexcused absences from the local school report card/transcript is required.

For application to grade 9 (fall admission), an official school record of disciplinary infractions for grades 7 and 8 are required.

For application to grades 10, 11, and 12 (fall admission if applicable) an official school record of disciplinary infractions from the previous two school years is required.

3. If incomplete applications are received, or if there is a discrepancy in the supporting documentation provided, the following procedures will be followed:

    a. The Greater Lowell Technical High School Admissions Department will notify the local school counselor and/or parent/guardian responsible for submitting the application that the application is incomplete or that there is a discrepancy, and will request completion, clarification, or adjustment.
    b. The applicant's parent(s)/guardian(s) will be notified by the Greater Lowell Technical High School Admissions Department in the event that the problem is not resolved by the local school counselor.
    c. If after notifying the local school counselor and parent(s)/guardian(s), the application remains incomplete for twenty calendar days, the application will be voided.

APPLICATION PROCESS – FOR ADMISSION TO THE NINTH TENTH, ELEVENTH AND TWELFTH GRADES FOR THE CURRENT SCHOOL YEAR

1. Students interested in applying to Greater Lowell Technical High School for current school year admission to the 9th, 10th, 11th, or 12th grade (if applicable) must:

    a. Complete and submit an electronic application through our website or print an application from our website at http://www.gltech.org/admissions, obtain an application from their local

school counselor, or contact the Admissions Office at admissions@gltech.org, (978) 441-4951 to request a paper application as early in the school year as possible. Applications are offered in student/family's home language.

b. Applications for admission must be submitted either electronically or by paper copy to Greater Lowell Technical High School as early in the school year as possible.

2. It is the responsibility of the local school counselor to:

   a. Upon notification that a student has applied, complete and submit their portion of the application, including required signatures, to the Greater Lowell Technical High School Admissions Office as soon as possible.
   b. Complete applications include:
      (i) Completed application form (including required signatures), official school record of grades, attendance, and discipline.
      (ii) For application to grades 9, 10, 11, and 12 (admission during the school year if applicable), the previous and current school year to date in English Language Arts, Mathematics, Science, and Social Studies or course equivalent from the local school report card/transcript are required.

      For application to grades 10, 11, and 12 (admission during the school year if applicable), the sum of the previous and current school year to date unexcused absences from the local school report card/transcript are required.

      For application to grades 9, 10, 11, and 12 (admission during the school year if applicable), an official school record of disciplinary infractions for the previous and current school year to date is required.

      For application to grades 9, 10, 11 & 12 (admission during the school year if applicable), recommendation from the local school counselor is required.

3. If incomplete applications are received, the following procedures will be followed:
   a. The Greater Lowell Technical High School Admissions Department will notify the local school counselor and/or parent/guardian responsible for submitting the application that the application is incomplete or that there is a discrepancy and will request completion, clarification, or adjustment.
   b. The applicant's parent(s)/guardian(s) will be notified by the Greater Lowell Technical High School Admissions Department in the event that the problem is not resolved by the local school counselor.
   c. If after notifying the local school counselor and parent(s)/guardian(s), the application remains incomplete for twenty calendar days, the application will be voided.

LATE APPLICATIONS

Applications received after February 3, 2025 will be evaluated using the same criteria as other applications, and the composite score will be integrated in rank order, high to low, on the established waitlist.

Please be aware that residents of Greater Lowell Regional Vocational School District (Dracut, Dunstable, Lowell, Tyngsborough) who meet the minimum admission requirements will be admitted before any non-residents. School choice students and nonresident students will be evaluated using the criteria contained in this Admission Policy.

WITHDRAWN STUDENTS

Students who withdraw from Greater Lowell Technical High School and who are attending or not attending another high school may reapply to Greater Lowell Technical High School following the procedures contained in this Admission Policy and will be evaluated using the criteria contained in this Admission Policy.

VII. SELECTION PROCESS

When more students apply to Greater Lowell Technical High School than available seats, GLTHS uses the following system to select students for admission. Completed applications are processed by the Admission Team using weighted admission criteria. Each applicant will be assigned a score derived from the sum of the sub-scores of the following criteria:

a. Scholastic Achievement: Maximum 40 points

Maximum 10 points per course in English Language Arts, Mathematics, Science, and Social Studies.

Grade Averages	**Points**
90-100 (A)	10
80-89 (B)	8
70-79 (C)	7
60-69 (D)	4
0-59 (F)	0

For application to grade 9 (fall admission), the final grades for grade 7 and 1st and 2nd Quarter/Trimester grades for grade 8 in English Language Arts, Mathematics, Science, and Social Studies or course equivalent from the local school report card/transcript are used.

For application to grades 10, 11, and 12 (fall admission if applicable), the final grades of the previous two school year's grades in English Language Arts, Mathematics, Science, and Social Studies or course equivalent from the local school report card/transcript are used.

For application to grades 9, 10, 11, and 12 (admission during the school year if applicable), the previous and current school years' grades to date in English Language Arts, Mathematics, Science, and Social Studies or course equivalent from the local school report card/transcript are used.

b. Attendance: Maximum 40 points

Number of Unexcused Absences	Points
0-2	40
3-5	35
6-8	30
9-11	25
12-14	20
15-17	15
18-27	10
28+	0

For application to grade 9 (fall admission), the sum of grade 7 and 1st and 2nd Quarter/Trimester grade 8 unexcused absences from the local school report card/transcript are used.

For application to grades 10, 11, and 12 (fall admission if applicable), the sum of the previous two school year's unexcused absences from the local school report card/transcript is used.

For application to grades 9, 10, 11, and 12 (admission during the school year if applicable), the sum of the previous and current school year to date unexcused absences from the local school report card/transcript are used.

c. School Discipline/Conduct: Maximum 20 points

An official school record of student discipline must be submitted as part of the application process. Points will be deducted only for infractions that resulted in suspensions or expulsion pursuant to M.G.L. c.71, § 37H or M.G.L. c.71, § 37H-½, or resulted in suspension or expulsion for more than 10 days for a single infraction or cumulatively pursuant to M.G.L. c.71, § 37H-¾.

Suspensions/Expulsions	Points
0 Suspensions/Expulsions	20
1 or more infractions that resulted in suspensions or expulsion pursuant to M.G.L. c.71, § 37H or M.G.L. c.71, § 37H-½, or resulted in suspension or expulsion for more than 10 days for a single infraction or cumulatively pursuant to M.G.L. c.71, § 37H-¾.	0

For application to grade 9 (fall admission), an official school record of disciplinary infractions for grades 7 and 8 are used.

For application to grades 10, 11, and 12 (fall admission if applicable) an official school record of disciplinary infractions from the previous two school years is used.

For application to grade 9, 10, 11, and 12 (admission during the school year if applicable), an official school record of disciplinary infractions for the previous and current school year to date is used.

Members of Greater Lowell Technical High School's Admission Team will assemble to review all completed applications received by February 3, 2025. The team will check each application for accuracy before awarding rating points in each category. A maximum total of 100 points can be earned. After awarding rating points, each category will be totaled. The resident applicants will be ranked by point total from high to low and will be selected for admission by rank order until all seats are filled. Those below the cut-off point will be placed on a waiting list. The cut-off point is determined annually by ranking all resident applicants point totals from high to low and selecting the number of applicants necessary to fill the Freshman Class. If openings occur, seats are filled by applicants from the waiting list by rank order from high to low.

Applicants that are waitlisted will remain on the waitlist for the remainder of the school year and will need to reapply each year if they remain interested in attending Greater Lowell Technical High School.

Non-resident applicants are evaluated using the criteria in this Admission Policy and will be placed on the applicant list after the resident applicants. Non-resident applicants on the list will only be accepted if all resident applicants have been accepted.

All students and their local school counselors are advised of their admission status (accepted or waitlisted) by the end of the first full week in April.

Applications received after February 3, 2025 will be evaluated using the same criteria as other applications and their composite score will be integrated in rank order on the established applicant waitlist.

ENROLLMENT

To enroll at Greater Lowell Technical High School for the fall, applicants must have been promoted by their local district to the grade they wish to enter. Acceptance and enrollment at Greater Lowell Technical High School are conditioned upon the accuracy and completeness of the student's application. Greater Lowell Regional Vocational School District reserves the right to revoke its conditional acceptance of any student, at any time, if it is determined that the student's parent(s)/guardian(s) or the student's sending school district provided inaccurate, incomplete, or misleading information during the application process.

Any student who is accepted but fails to respond to the offer or register, after repeated notifications to the parent(s)/guardian(s) and the local sending school principal, and the registration remains incomplete for twenty calendar days, the student's acceptance may be rescinded and considered a declined acceptance.

Prior to the first day of school, and in accordance with Massachusetts State Law, updated immunization records of all accepted, incoming students must be forwarded to Greater Lowell Technical High School.

VIII. EXPLORATORY PROGRAM

Because Greater Lowell Technical High School offers 5 or more Chapter 74 state-approved programs, GLTHS provides a full year exploratory program for ninth-grade students, which is based on the applicable Vocational Technical Education and Massachusetts Curriculum Frameworks.

All ninth-grade students who enroll in Greater Lowell Technical High School participate in a technical exploratory program designed to help them learn about their talents and interests relative to a variety of different vocational-technical programs, including some that are non-traditional for their gender.
Students who enroll in Greater Lowell Technical High School after grade nine may select to explore a vocational technical program (Shop) based upon available openings.
Students are evaluated using the following criteria: Maximum 100 points.

Safe Use of Equipment/Correct Use of Shop Specific Tools, and Materials	10
Performance Assessment	50
Coursework/Project Completion	20
Responsibility and Following Instructions	20

If the number of enrollees seeking a particular technical program (Shop) exceeds the number of openings, the evaluative exploratory grades would determine the enrollee or enrollees who are placed in the particular technical program (Shop). In the case of tie scores, the cumulative average of all exploratory grades will be used as the first tiebreaker with attendance being used as the second tiebreaker after adjusting for documented excused absences.

Students who wish to transfer from one technical program (Shop) to another during the school year may apply for transfer by contacting their school counselor. Transfer requests will be considered subject to the availability of openings in the requested technical programs (Shops). Each transfer applicant will be interviewed and counseled individually to determine the appropriateness of the transfer for the particular student.

IX. REVIEW AND APPEALS PROCESS

ADMISSION TO GREATER LOWELL TECHNICAL HIGH SCHOOL

If Greater Lowell Technical High School does not accept an applicant, or places them on a waitlist, the applicant or their parent/guardian may request that the Assistant Superintendent/Principal of Greater Lowell Technical High School review that decision within 30 days. These requests can be made in the following ways:

By e-mail	**By hard-copy mail or hand delivery**
mbarton@gltech.org	250 Pawtucket Boulevard, Tyngsborough, MA 01879

The Assistant Superintendent/Principal will respond, within thirty days, to these requests for review in writing and indicate whether the decision to deny admission to the student, or waitlist the student, will stand or be

overturned. The Director of Technology, Enrollment and Information shall maintain documentation as to the specific admission requirements that were used to deny admission and shall provide such documentation for the Assistant Superintendent/Principal to review.

If after the review, the parent/guardian wishes to appeal the decision of the Assistant Superintendent/Principal, the parent/guardian may request that the Superintendent-Director of Greater Lowell Technical High School review that decision within 30 days. These requests can be made in the following ways:

By e-mail	By hard-copy mail or hand delivery
jdavis@gltech.org	250 Pawtucket Boulevard, Tyngsborough, MA 01879

The Superintendent-Director will respond, within thirty days, to these requests for review in writing and indicate whether the decision to deny admission to the student, or waitlist the student, will stand or be overturned. The Director of Technology, Enrollment and Information shall maintain documentation as to the specific admission requirements that were used to deny admission and shall provide such documentation for the Superintendent-Director to review.

ADMISSION TO SPECIFIC PROGRAMS WITHIN GREATER LOWELL TECHNICAL HIGH SCHOOL

Students who have been admitted to Greater Lowell Technical High School will need to apply to a specific program of study (also known as a "technical major" or "Shop") during freshman year/2nd semester.

If the student applies to a program and is denied or waitlisted, the student may appeal their rejection to the Assistant Superintendent/Principal in the following ways:

By e-mail	By hard-copy mail or hand delivery
mbarton@gltech.org	250 Pawtucket Boulevard, Tyngsborough, MA 01879

In making this determination, the Assistant Superintendent/Principal will review the following information: Verification of exploratory grade in student's first technical program choice, overall exploratory grade average in all exploratories, and unexcused absences.

X. MAINTENANCE OF RECORDS

Greater Lowell Technical High School maintains records of all students who apply, enroll, or are waitlisted, as well as their score on admission criteria, to facilitate analysis of its admissions system and compliance with applicable laws and regulations. Greater Lowell Technical High School will provide this information to the Department upon request.