Shawsheen Valley Vocational Technical High School

Program of Studies

Academic and Technical Course Offerings

2024-2025

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General Information

Mission

At Shawsheen Valley Technical High School (SVTHS), it is our mission to provide a positive learning experience in a safe educational environment that encourages all students to reach their full potential, emphasizes the value of a strong work ethic, and prepares them for adult life in a competitive world.

Core Values

At the heart of our mission is our commitment to preparing students for adult life in a competitive world, which requires a strong work ethic, regardless of the career paths students pursue. For that reason, we determined the need to identify and prioritize core values for the SVTHS community. Core values define how everyone in our school community will work together to achieve the school's mission. At SVTHS we have adopted the core values of **Accountability, Integrity, and Respect**. The core values we selected reflect values that are in demand from employers across all fields and are qualities we believe are essential for all SVTHS students and staff to exhibit.

SVTHS Core Values		
Accountability *Take responsibility for your words, actions, and commitments.*	**Integrity** *Be honest and do the right thing, even when no one else is watching.*	**Respect** *Treat everyone the way you wish to be treated.*
At SVTHS, we strive to be our best selves, and hold ourselves accountable for our own words and actions. We follow through on our commitments and take responsibility when we fail to meet this standard.	We believe in being honest and doing the right thing. We hold ourselves to this high standard even when it is inconvenient or when no one else is watching.	We are committed to creating a safe, welcoming, and inclusive learning environment for all members of our community. We exhibit respect for one another through our words and actions, and by assuming best intentions of one another.
We exhibit accountability by: ▪ Showing up on time. ▪ Showing up prepared. ▪ Following through on our commitments. ▪ Asking for help when we need it. ▪ Learning from our mistakes. ▪ Being a part of the solution.	*We exhibit integrity by:* ▪ Being honest and trustworthy. ▪ Doing what is right. ▪ Putting in our best effort. ▪ Setting a good example for our peers. ▪ Accepting responsibility for our mistakes. ▪ Repairing our mistakes.	*We exhibit Respect by:* ▪ Speaking kindly to one another. ▪ Listening to one another. ▪ Cleaning up after ourselves. ▪ Accepting & celebrating differences. ▪ Treating every day like a new day. ▪ Assuming best intentions.

Philosophy

Shawsheen Valley Technical High School provides rich and varied opportunities for students to demonstrate growth and achievement by delivering the highest level of academic and vocational/technical education. The Shawsheen experience leaves students with an understanding that education is a lifelong, continuous process with many paths to a successful and fulfilling adult life. Recognizing that each student is driven by his or her own unique talents and interests, we offer meaningful vocational instruction that models current industry standards and instills positive occupational and critical thinking skills. With diversity and equality in mind, we encourage non-traditional shop selection and placement. The implementation of rigorous academic programs further supports our goal to deliver a comprehensive educational experience. Shawsheen graduates are poised to succeed in industry and post-secondary education.

Through relevant curriculum, exploration, skill building, and authentic community-based experiences, Shawsheen Valley Technical High School students learn to make informed career choices. Students also learn to think critically, communicate effectively, and value our diverse world, culminating in co-operative employment. Valued traits like problem-solving, time management, and consistent attendance, are among principles we reinforce with students. We continually celebrate student achievement and offer diverse opportunities for students of varying abilities to demonstrate their skills. We recognize the need to assess the varying abilities and capacities of students and adjust innovatively to accommodate those differences.

Shawsheen Valley Technical High School maintains a highly trained faculty and staff who model professional careers and behaviors and engage in professional development opportunities provided by the district. Educators collaborate with industry leaders, advisors, and each other to create a career and technical high school that exceeds national standards and welcomes global competition, while prioritizing our commitment to the regional community. We foster a mutually beneficial relationship between our students and that community, and the district provides resources to support this mission.

General Course Policy Grades 9-12

- Exploratory. SVTHS has a diverse curriculum designed to produce a well-rounded graduate who has a high level of expertise in a particular vocational-technical area. During the ninth grade, all students explore 14 shop programs. At the end of the final exploratory cycles, students are assigned to a permanent shop for grades 10, 11, and 12.

- Academic Course Prerequisites. Enrollment in some academic courses requires the completion of prerequisite course work or the attainment of a threshold score on a qualifying test. The prerequisites—which occur in grades 9-12 at the Honors, College Preparatory, and Developmental levels—are identified in the Program of Studies.

- Promotion. The Program of Studies also contains a complete explanation of the course offerings and credits by grade level.
    - In order to be promoted to the sophomore year, a student must have successfully completed thirty-five (35) freshman credits, which must include English, social studies,

mathematics, and science.

- In order to be promoted to the junior year, a student must have successfully completed thirty-five (35) sophomore credits, which must include shop, related theory, two (2) years of English, two (2) years of mathematics, two (2) years of social studies, and two (2) years of science.
- In order to be promoted to the senior year, a student must have successfully completed thirty-five (35) junior credits, which must include two (2) years of shop, two (2) years of related theory, three (3) years of English, three (3) years of mathematics, two (2) years of social studies (which must include U.S. History I and II), two (2) years of science and a third (3rd) year of social studies or science.

Graduation Requirements

- Graduation. To fulfill graduation requirements, a student must have successfully completed or demonstrated the following.
  - Thirty-five (35) senior credits
  - Four (4) years of English, four (4) years of physical education, three (3) years of shop, three (3) years of related theory, three (3) years of mathematics, two (2) years of social studies (including United States History I and II), two (2) years of science, and a third (3rd) year of social studies or science.
  - MCAS competency in ELA, Mathematics, and Science/Technology/Engineering.

Report Cards

SVRVTSD's numerical grades on quarterly reports represent the following alphabetic equivalents:

A+	96-100	B-	80-82	D	63-66
A	93-95	C+	77-79	D-	60-62
A-	90-92	C	73-76	F	Below 60
B+	87-89	C-	70-72	I	Incomplete*
B	83-86	D+	67-69	M	Medical**

*Requires completion of make-up work
**Excuses makeup requirement

Grade reports are issued four (4) times during the year at the conclusion of each term. Mid-quarter progress reports are issued in the middle of each term. All grade reports are available for viewing in the Aspen Family Portal.

Class rank and Grade Point Equivalence (GPA). Class rank—a measure based on a student's GPA—is a clear indicator of where a student stands academically in relation to his or her classmates. A student's GPA is based upon the number of courses, level of difficulty, and grades received during his or her academic career. Class rank is given strong consideration in college acceptances and in the awarding of scholarships.

Quality points are determined by multiplying the factor obtained from the following scale by the number

of credits for that particular course. Quality Point Average is obtained by dividing the total number of quality points by the total number of credits. Quality Point Average will be used to determine class rank and as one of the criteria used to determine National Honor Society and National Vocational Honor Society eligibility.

Final Course Average		Level of Class					
Numeric	Alpha	Concurrent Enrollment	1	2	3	4	5
100-96	A+	4.20	4.00	3.80	3.50	3.20	3.00
95-93	A	4.15	3.95	3.75	3.45	3.15	2.95
92-90	A-	4.05	3.85	3.65	3.35	3.05	2.85
89-87	B+	3.95	3.75	3.55	3.25	2.95	2.75
86-83	B	3.70	3.50	3.30	3.00	2.70	2.50
82-80	B-	3.45	3.25	3.05	2.75	2.45	2.25
79-77	C+	3.20	3.00	2.80	2.50	2.20	2.00
76-73	C	2.95	2.75	2.55	2.25	1.95	1.75
72-70	C-	2.70	2.50	2.30	2.00	1.70	1.50
69-67	D+	2.45	2.25	2.05	1.75	1.45	1.25
66-63	D	2.20	2.00	1.80	1.50	1.20	1.00
62-60	D-	1.95	1.75	1.55	1.25	0.95	0.75
<59	F	0.00	0.00	0.00	0.00	0.00	0.00

Course Selection and Course Changes

Course changes are disruptive to the continuity of a student's educational program. For this reason, the course-selection process that takes place each spring is conducted with great care and with input from teachers and guidance counselors. Course changes will be handled as follows:

- To the extent possible, all course change requests should occur prior to the start of the school year.
- Once the school year beings, course change requests must be submitted within the first two weeks of school.
- Should extraordinary circumstances warrant a change in a student's schedule after the first two weeks of the school year, the following criteria will be considered:
  - Course changes will only be implemented at the end of the grading period.
  - Students must attend after school help on a consistent basis within their course before resorting to a course-change request.
  - The course change request has been reviewed by the teacher and the guidance counselor and approved by the administration.

Articulation Agreements

Shawsheen Valley Regional Vocational Technical High School has articulation agreements with several post-secondary institutions. These articulation agreements allow students who have completed shop coursework to apply for college credit upon graduation from SVTHS. Agreements vary based on the vocational program so students are encouraged to work with their guidance counselor to determine eligibility. More information can be found here Chapter 74

Articulation Agreements Dual Enrollment State Board Approved.pdf (shawsheentech.org)

Concurrent Enrollment

Concurrent enrollment allows students to take college-level classes during their high school schedule. Classes are taught by Shawsheen teachers who have been vetted by Middlesex Community College. Students are delivered a rigorous college-level curriculum, and concurrently fulfill their high school graduation requirements, while also earning college credit if they elect to do so. Eligibility for concurrent enrollment courses offered at Shawsheen is as follows:

Course	Eligibility Requirements
1ENG101 English Composition 1 (3 credits) 1ENG101H English Analysis (3 credits)	▪ Meets readiness requirements for ENG101 with PSAT or SAT score of 480 or higher for Evidence Based Reading and Writing ▪ 85% or higher in 11th grade English course ▪ At least a 3.0 high school grade point average ▪ 11th grade English teacher recommendation
2GOV120 American Government (3 credits)	▪ Meets readiness requirements for ENG101 with PSAT or SAT score of 480 or higher for Evidence Based Reading and Writing ▪ At least a 3.0 high school grade point average ▪ 11th grade History teacher recommendation

3MAT177 Statistics (3 credits)	▪ Meets readiness requirements for ENG101 with PSAT or SAT score of 480 or higher for Evidence Based Reading and Writing ▪ 85% or higher in 10th grade Honors Algebra II (3020) or 11th grade Algebra II (3031)* ▪ At least a 3.0 high school grade point average ▪ 11th grade Mathematics teacher recommendation *Eligibility consideration will be given to students enrolled in 11th grade Algebra II (3032 and 3033) pending Academic Coordinator approval.
3MAT290 Calculus I for Science and Engineering (3 credits)	▪ Meets readiness requirements for ENG101 with PSAT or SAT score of 480 or higher for Evidence Based Reading and Writing ▪ 85% or higher in 11th grade Honors Pre-Calculus 3030 ▪ At least a 3.0 high school grade point average ▪ 11th grade Mathematics teacher recommendation

5CHE121 Intro to Chemistry (4 credits)	▪ Meets readiness requirements for ENG101 with PSAT or SAT score of 480 or higher for Evidence Based Reading and Writing ▪ 80% or better in 10th grade Honors Algebra II or Geometry and 90% or higher in Level 2 9th grade Algebra 1. ▪ At least a 3.0 high school grade point average ▪ 10th grade Science teacher recommendation
5PHY151 Physics I (4 credits)	▪ Meets readiness requirements for ENG101 with PSAT or SAT score of 480 or higher for Evidence Based Reading and Writing ▪ 80% or better in 10th grade Honors Algebra II or Geometry and 90% or higher in Level 2 9th grade Algebra 1. ▪ At least a 3.0 high school grade point average ▪ 10th grade Science teacher recommendation

Program Overview

Shawsheen Valley Technical High School prepares students for post-secondary education. Students are offered a variety of honors, college preparatory, and support services level courses that are designed to meet the specific academic needs of students. Shawsheen's academic programs prepare students for admission to either two-year community-college programs or four-year baccalaureate programs. Additionally, Shawsheen offers Concurrent Enrollment courses for qualified upperclassmen. Shawsheen Valley Technical High School offers students twenty-four (24) vocational technical programs (listed below) that are offered in twenty (20) shop settings. The experience that students acquire through said programs prepares students to enter the workforce prepared with the skills and knowledge necessary for success in a highly competitive 21st Century workplace. All academic elective courses listed in the program of studies are subject to cancellation due to low enrollment.

Vocational Technical Programs
Advanced Manufacturing (Formerly Machine Tool Technology)
Automotive Collision Repair & Refinishing
Automotive Technology
Business Technology/Marketing
Carpentry
Cosmetology
Culinary Arts/Hospitality Management
Dental Assisting
Design & Visual Communications
Drafting
Electricity
Electronics/Engineering Technology
Graphic Communications
Health Assisting
Heating-Ventilation-Air Conditioning-Refrigeration
Information Support Services & Networking/Programming & Web Development
Masonry & Tile Setting
Medical Assisting
Metal Fabrication & Joining Technologies
Plumbing

Academic Programs

9th GRADE COURSES			
		Level	**Credits**
ENGLISH LANGUAGE ARTS			
1011	Honors Freshman English	1	5.0
1012	CP Freshman English	2	5.0
1013	CP Freshman English	3	5.0
1014	CP Freshman English	4	5.0
1015	CP Freshman English	5	5.0
9114	Freshman English*	5	5.0
MATHEMATICS			
3010	Honors Geometry	1	5.0
3011	CP Algebra I	2	5.0
3012	CP Algebra I	3	5.0
3013	CP Algebra I	4	5.0
9312	Algebra I*	5	5.0
SCIENCE			
5011	Honors Lab Cell Biology	1	5.0
5012	CP Lab Cell Biology	2	5.0
5013	CP Lab Cell Biology	3	5.0
9511	Cell Biology*	5	5.0
SOCIAL STUDIES			
2010	Honors U.S. History I	1	2.5
2011	CP U.S. History I	2	2.5
9211	U.S. History I*	5	2.5
4010	CP 21st Century Civic Literacy (Semester course)	1	1.25
9410	21st Century Civic Literacy * (Semester course)	1	1.25
4011	CP Digital Literacy and Citizenship (Semester course)	1	1.25
9411	Digital Literacy and Citizenship (Semester course)	1	1.25
PHYSICAL EDUCATION/WELLNESS			
6100-6101	Physical Education and Wellness Students take one semester of Freshman Fitness and one semester of Freshman Health/Aquatics	1	1.5
CVTE PROGRAM & RELATED THEORY			
	CP Career Awareness, Health & Safety (Terms 1-3)	1	15.0
	Technology Shop/Lab (Term 4)	1	5.0
TOTAL REQUIRED CREDITS			**41.5**
** Enrollment in this course requires an IEP, TEAM recommendation, and parental consent.*			

10th GRADE COURSES			
		Level	Credits
ENGLISH LANGUAGE ARTS			
1021	Honors Sophomore English	1	5.0
1022	CP Sophomore English	2	5.0
1023	CP Sophomore English	3	5.0
1024	CP Sophomore English	4	5.0
1025	CP Sophomore English	5	5.0
9124	Sophomore English *	5	5.0
MATHEMATICS			
3020	Honors Algebra II	1	5.0
3021	CP Geometry	2	5.0
3022	CP Geometry	3	5.0
3023	CP Geometry	4	5.0
3024	CP Advanced Algebra 1	2	5.0
9322	Geometry*	5	5.0
SCIENCE			
5021	Honors Lab Biodiversity	1	5.0
5022	CP Lab Biodiversity	2	5.0
5023	CP Lab Biodiversity	3	5.0
9522	Biodiversity & Ecology*	5	5.0
SOCIAL STUDIES			
2020	Honors U.S. History II	1	2.5
2021	CP U.S. History II	2	2.5
9223	U.S. History II*	5	2.5
PHYSICAL EDUCATION/ WELLNESS			
6200-6201	Sophomore Physical Education and Wellness Students take one semester of Sophomore Fitness and one semester of Sophomore Health/Aquatics	1	1.5
CVTE PROGRAM & RELATED THEORY			
	Sophomore College Preparatory Related Technology	1	2.5
	Technology Shop/Lab	1	20.0
TOTAL REQUIRED CREDITS			**41.5**
** Enrollment in this course requires an IEP, TEAM recommendation, and parental consent.* ***Administrative recommendation required.*			

11th GRADE COURSES			
		Level	**Credit**
ENGLISH LANGUAGE ARTS			
1031	Honors Junior English	1	5.0
1032	CP Junior English	2	5.0
1033	CP Junior English	3	5.0
1034	CP Junior English	4	5.0
1035	CP Junior English	5	5.0
9134	Junior English*	5	5.0
MATHEMATICS			
3030	Honors Pre-Calculus	1	5.0
3031	CP Algebra II	2	5.0
3032	CP Algebra II	3	5.0
3033	CP Algebra II	4	5.0
9332	Algebra II*	5	5.0
SCIENCE			
5CHE121J	Intro to Chemistry, Concurrent Enrollment	CE	5.0
5032	CP Lab Chemistry	2	5.0
5034	CP Lab Physical Science	3	2.5
5035	CP Lab Horticulture	3	2.5
5036	Conceptual Biology**	3	2.5
SOCIAL STUDIES			
2030	Honors Modern World History	1	2.5
2031	CP Modern World History	2	2.5
9232	Modern World History*	5	2.5
WORLD LANGUAGE			
4031	CP Spanish I	1	2.5
4034	CP Spanish II	1	2.5
4037	CP Spanish III	1	2.5
4033	CP Spanish I (Summer course)	1	2.5
4035	CP Spanish I (After-school course)	1	2.5
4036	CP Spanish II (After-school course)	1	2.5
PHYSICAL EDUCATION/ WELLNESS			
6300-6301	Junior Physical Education and Wellness Students take one semester of Junior Sports & Fitness and one semester of Junior Health	1	1 .0
SUPPORT SERVICES			
9030	Postsecondary Transition Planning I*	5	2.5
9031	Academic Support*	5	2.5
CVTE PROGRAM & RELATED THEORY			
	Junior College Preparatory Related Technology	1	5.0
	Technology Shop/Lab	1	20.0
TOTAL REQUIRED CREDITS			**41**
** Enrollment in this course requires an IEP, TEAM recommendation, and parental consent.* ***Administrative recommendation required.*			

12th GRADE COURSES			
ENGLISH LANGUAGE ARTS			
1ENG101	English Composition 1, Concurrent Enrollment	CE	5.0
1ENG101H	English Composition 1, Concurrent Enrollment + Honors Literary Analysis	CE	6.5
1042	CP Senior English	2	5.0
1043	CP Senior English	3	5.0
1044	CP Senior English	4	5.0
1045	CP Senior English	5	5.0
9144	Senior English*	5	5.0
MATHEMATICS			
3MAT177	Statistics, Concurrent Enrollment	CE	5.0
3MAT290	Calculus I for Science and Engineering, Concurrent Enrollment	CE	5.0
3041	CP Pre-Calculus	2	5.0
3042	CP Statistics	2	5.0
3045	CP Functional Analysis and Trigonometry	2	2.5
3043	CP Introduction to Statistics and Trigonometry	3	5.0
3044	CP Mathematical Applications	4	2.5
9344	Mathematical Applications *	4	2.5
SCIENCE			
5PHY151	Physics I, Concurrent Enrollment	CE	5.0
5048	Honors Lab Anatomy & Physiology	1	5.0
5041	CP Lab Physics	2	5.0
5042	CP Lab Chemistry	2	5.0
5043	CP Lab Anatomy & Physiology	2	5.0
5047	CP Lab Environmental Science	2	2.5
5044	CP Lab Physical Science	3	2.5
5045	CP Lab Horticulture	3	2.5
SOCIAL STUDIES			
2GOV120	American Government, Concurrent Enrollment	CE	2.5
2042	CP America at War	2	2.5
2043	CP Legal Issues	2	2.5
2044	CP Introduction to Psychology	2	2.5
2050	CP Modern World	2	2.5
2048	CP Untold History	2	2.5
4040	CP Personal Financial Literacy and Economics	2	2.5
2046	CP Digital Literacy and Citizenship II	2	2.5
9243	Legal Issues*	5	2.5
WORLD LANGUAGE			
4041	CP Spanish I	1	2.5
4042	CP Spanish II	1	2.5
4047	CP Spanish III	1	2.5
4043	CP Spanish I (Summer course)	1	2.5
4044	CP Spanish II (Summer course)	1	2.5
4045	CP Spanish I (After-school course)	1	2.5
4046	CP Spanish II (After-school course)	1	2.5
PHYSICAL EDUCATION/WELLNESS			
6400-6401	Senior Physical Education and Wellness Students take one semester of Senior Sports & Fitness and one semester of Senior Health	1	.50
6441	Weight & Cardio Training	3	2.5
6442	Team Games & Outdoor Adventures	3	2.5
6431	Living Well	3	2.5
SUPPORT SERVICES			
9040	Postsecondary Transition Planning II*	5	2.5
9041	Academic Support	5	2.5
CVTE PROGRAM & RELATED THEORY			
	Senior College Preparatory Related Technology	1	5.0

	Technology Shop/Lab	1	20.0
TOTAL REQUIRED CREDITS			**40.5**
** Enrollment in this course requires an IEP, TEAM recommendation, and parental consent.* ***Administrative recommendation required.*			

English Language Arts Course Descriptions

Students at Shawsheen are required to take and pass four (4) years of English Language Arts. Freshman, sophomore, junior and senior English are offered at the honors, college preparatory and support services levels. Placement into each of the levels is determined by standardized comprehension scores, writing scores, and by teacher recommendation. Please see the descriptions on pages 14-15 for a more detailed explanation of the placement criteria for each level. Two Concurrent Enrollment English courses are offered during senior year. Eligibility for these courses is outlined on page 6.

GRADE 9

1011-1015: Honors & College Prep Freshman English: Identity and Self
Aligned with the *Massachusetts English Language Arts and Literacy Framework*, this course is an introduction to five major standards in the *Framework*: reading, writing, language, speaking,and listening. Students experience a broad range of literature, including novel, short story, poetry, drama, and non-fiction informational text. Writing will focus on argument/persuasion, exposition, analysis, and narrative tasks with emphasis placed on text-based evidence/support.
9114: Freshman English* Enrollment in this course requires an IEP, TEAM recommendation, and parental consent.

GRADE 10

1021-1025: Honors & College Preparatory Sophomore English: Heroes Across Time Aligned with the *Massachusetts English Language Arts and Literacy Framework*, this course continues the development of the skills identified within the five major standards of the *Framework*, scaffolding on the foundation established in Grade 9. Focus is given to the state- mandated MCAS (graduation requirement), including test-taking strategies that are embedded into the curriculum along with the synthesis of multiple texts. There is a continued developmentof argument/persuasion, exposition, analysis, and narrative writing skills with text-based evidence/support expected from multiple sources.
9124: Sophomore English * Enrollment in this course requires an IEP, TEAM recommendation, and parental consent.

GRADE 11

1031-1035: Honors & College Preparatory Junior English: The American Story
Aligned with the Massachusetts English Language Arts and Literacy Framework, this course examines American Literature from multiple perspectives in the context of the skills required in the five major standards of the Framework. Students will analyze text through historical and critical viewpoints with focus on stylistic, social, and economic context. Writing emphasis includes independent development of an original thesis/claim with analysis/critical thinking at the highest levels within the cognitive domain of Bloom's Taxonomy for argument, expository, analytical and research tasks.
9134: Junior English * Enrollment in this course requires an IEP, TEAM recommendation, and parental consent.

GRADE 12

1ENG101: English Composition 1

English Composition I is a concurrent enrollment course taught through Middlesex Community College by Shawsheen ELA faculty in the students' regular academic schedule. The composition course 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 revisions, students will produce multiple source-based, thesis driven essays with appropriate use of MLA documentation. Students will receive both high school and college credit for this course. Students must meet the following pre-requisites to enroll in said course: Score of 480 or higher on PSAT or SAT verbal; a grade of 85% or better in Junior English, and at least 3.0 high school grade point average.

1ENG101H: English Composition 1 + Honors Literary Analysis (6.5 credits/CE Weight)

In addition to taking English Composition I (either with or without Middlesex credit), students will take the Honors-level Senior English course, which is aligned with the Massachusetts English Language Arts and Literacy Framework. This course furthers student mastery of skills required in the five major standards of the Framework as well as providing context from a world perspective. Reading selections include classic literary works, contemporary titles, and informational text. Writing tasks include research-based products, personal narratives, and analysis of complex texts (literature and informational). An independent summer reading project is required, and students should be expected to engage in independent work. Students must meet the pre-requisites for both the English Honors level and CDE English Composition (Score of 480 or higher on PSAT or SAT verbal; a grade of 85% or better in Junior English, and at least a 3.0 high school grade point average).

1042-1045: College Preparatory Senior English: Ourselves and the World

Aligned with the *Massachusetts English Language Arts and Literacy Framework*, this course furthers student mastery of skills required in the five major standards of the *Framework* as well as providing context from a world perspective. Reading selections include classic literary works,contemporary titles, and informational text. Writing tasks include research-based products, personal narratives, and analysis of complex texts (literature and informational).

9144: Senior English * Enrollment in this course requires an IEP, TEAM recommendation, and parental consent.

English Level Descriptions

Level 1: Honors

Honors courses are designed for students (a) whose standardized reading comprehension score is three or more years above grade level on a standardized assessment and (b) whose SWT portfolio submissions has received a minimum holistic rating of six on an 8-point scale. The prerequisite for placement in Level 1 (Honors) also includes (c) maintaining an average in College Prep, Level 1 (Honors) of no lower than an 80 or a teacher recommendation or (d) maintaining an average in College Prep, Level 2 of no lower than an 87 and a teacher recommendation. Independent summer-reading projects are required components of all (grades 9-12) Honors courses.

Level 2: College Preparatory

CP Level-2 courses are designed for students (a) whose standardized reading comprehension is above grade level on a standardized assessment (b) whose SWT writing portfolio submissions has received a

minimum holistic rating of five on an 8-point scale.

Level 3: College Preparatory
CP Level-3 courses are designed for students (a) whose standardized reading comprehension score is at or near grade level on a standardized assessment (b) whose SWT has received a minimum holistic rating of four on an 8-point scale.

Level 4: College Preparatory
CP Level-4 courses are designed for students whose reading comprehension score is below grade level (but not more than 3 years below grade level) on a standardized assessment. The most general goal at this level is the strengthening of reading, writing, and language skills in a setting that adjusts instructional tasks, materials, and pace to accommodate observed deficits. At this level, teachers more actively intervene in both the reading and writing processes than they do at the other college-preparatory levels.

Level 5: College Preparatory
Level-5 courses are designed for students whose reading comprehension is more than 3 years below grade level on a standardized assessment. The most general goal at this level is the effective treatment of diagnosed reading and writing deficits by practitioners certified as Reading Specialists, Consulting Teachers of Reading, or English Language Arts.

English Language Education Program Descriptions

English language skills are taught to enable English Learners (EL) students to become competent in the English language. The program emphasizes mastery of English language skills and content area concepts in order to participate effectively in standard academic and vocational programs. Furthermore, the purpose of the English Learner Education (ELE) program is to annually assess students' reading, writing, speaking and listening skills, which is mandated by state and federal law.

Instructional Program
The following guidelines are used to plan instructional programs for English learners. The guidelines are organized by WIDA English Language Proficiency Performance Levels and address both English language development (ELD) instruction and sheltered content instruction.

English Language Development (ELD) instruction
ELD instruction addresses listening, speaking, reading and writing standards as contained in the WIDA Standards of English Language Proficiency (www.wida.us). ELD instruction is designed specifically for English Learners (Els) to "catch up" with their classmates in academic content areas. The ELD curriculum is based on WIDA Standards. Shawsheen Valley Vocational Technical High School promotes and supports the rapid acquisition of English language proficiency. Thus, all EL students receive ELD instruction (Entering, Emerging, Developing, Expanding, and Bridging levels).

Sheltered Content Instruction
Sheltered content instruction is designed to make content instruction, delivered in English, more comprehensible for English Learner (EL) students with a WIDA Developing level or higher of English proficiency. It will be challenging for Entering and Emerging students.

Mathematics Course Descriptions

Students at Shawsheen are required to take and pass three (3) years of Mathematics. Freshman, sophomore, junior and senior Mathematics are offered at the honors, college preparatory and support services levels. Additionally, two Concurrent Enrollment Math courses are offered during senior year. Placement into each of the levels is determined by standardized scores and teacher recommendation.

GRADE 9

3010: Honors Geometry

This course is offered to freshmen who have demonstrated strong mathematics skills as measured by their performance on the ninth-grade Mathematics Entrance Placement Exam. Aligned with the *Massachusetts Mathematics Frameworks*, this course covers a wide range of topics, including points, lines, planes, properties and uses of congruent triangles, similar polygons, right triangles, circles, areas of plane figures, areas and volumes of solids, coordinate geometry, and transformations. Students who successfully complete this course and who receive the teacher's recommendation will continue in the Honors Mathematics Program with placement into sophomore Honors Algebra II.

3011: College Preparatory Algebra I

This course is offered to freshmen who have demonstrated proficiency in basic mathematical concepts and a readiness to study CP Algebra I, based on the results of the school's placement exam. Aligned with the Massachusetts Mathematics Frameworks, this course provides a solid foundation in the algebraic skills that are necessary to pursue upper-level mathematics. This course covers a wide range of topics, including integers, rational numbers, equations and inequalities, exponents and polynomials, factoring, systems of equations and relations, functions and graphs. Students are also introduced to problem solving strategies and applications of algebra to real-world problems. Students who successfully complete Algebra I will be placed into CP Geometry in grade 10.

3012: College Preparatory Algebra I

This course is offered to freshmen who have demonstrated readiness to study CP Algebra I at a level that anticipates their computational and conceptual maturity, based on the results of the school's placement exam. Aligned with the *Massachusetts Mathematics Frameworks*, this course covers a wide range of topics, including integers, rational numbers, equations and inequalities, exponents and polynomials, factoring, systems of equations and relations, functions,and graphs. Content breadth is differentiated to accommodate the pace of instruction. Students who successfully complete Algebra I will be placed into CP Geometry in grade 10.

3013: College Preparatory Algebra I

This course is offered to freshmen who have demonstrated readiness to study CP Algebra I at alevel that anticipates their computational and conceptual maturity while strengthening their understanding of basic mathematics skills and concepts, based on the results of the school's placement exam. Aligned with the *Massachusetts Mathematics Frameworks*, this course coversintegers, rational numbers, equations and inequalities, exponents and polynomials, factoring, systems of equations and relations, functions, and graphs. Content breadth is differentiated to accommodate the pace of instruction. Students who successfully complete Algebra I will be placed into CP Geometry in grade 10.

9312: Algebra I * Enrollment in this course requires an IEP, TEAM recommendation, and parental consent.

GRADE 10

3020: Honors Algebra II

This course is offered to sophomores who have successfully completed Honors Geometry in grade 9 and whose placement has been recommended by the Honors Geometry teacher or for students who have successfully completed the Edmentum Geometry summer course offering with a final average of 85% or better. Eligibility for enrollment in the Edmentum Geometry summer course offering requires a minimum grade of 93 or better in CP Algebra I, teacher of record recommendation and Director of Academic Programs final approval, prior to registration. Students at this level of mathematics must exhibit strong and consistent mathematical understanding and study skills. Aligned with the *Massachusetts Mathematics Frameworks*, this covers a wide range of topics. After an initial review of the fundamentals of functions and equations from Algebra I, students in this course will continue to explore patterns, relations, and functions. Students will be exposed to quadratics, higher order polynomials, complex numbers, compositions of functions, logarithms, exponentials, and radical and rational equations. Students will be expected to demonstrate understanding of the relevance of mathematical operations in problem solving, communications, and reasoning skills. Students who successfully complete thiscourse will be placed into Honors Pre-Calculus in grade 11.

3021: College Preparatory Geometry

This course is offered to sophomores who have successfully completed CP Algebra 1 in grade 9 and whose placement has been recommended by the Algebra I teacher. Aligned with the *Massachusetts Mathematics Frameworks*, this course covers a wide range of topics—including the study of points, lines, planes, congruent triangles, similar polygons, right triangles, circles, areas of plane figures, and areas and volumes of solids. Students will explore critical relationships between figures, specifically congruence and similarity, and proper notation will bestressed. Students will be encouraged to develop spatial sense and to apply these principles to numerical and algebraic applications. Students who successfully complete this course will be prepared to continue their study of Algebra II in grade 11.

3022: College Preparatory Geometry

This course is offered to sophomores who have successfully completed CP Algebra 1 in grade 9 and whose placement has been recommended by the Algebra I teacher. Aligned with the *Massachusetts Mathematics Frameworks*, this course covers a wide range of topics—including the study of points, lines, planes, congruent triangles, similar polygons, right triangles, circles, areas of plane figures, and areas and volumes of solids. Students will explore critical relationships between figures, specifically congruence and similarity, and proper notation will bestressed. The instructional method and pace anticipate, and are differentiated to accommodate, the learning profile of students placed into this course. Students who successfully complete this course will be prepared to continue their study of Algebra II in grade 11.

3023: College Preparatory Geometry

This course is offered to sophomores who have successfully completed CP Algebra 1 in grade 9 and whose placement has been recommended by the Algebra I teacher based on a program- mandated objective evaluation. Aligned with the *Massachusetts Mathematics Frameworks*, this course covers a wide range of topics—including the study of points, lines, planes, congruent triangles, similar polygons, right triangles, circles, areas of plane figures, and areas and volumes of solids. Students will explore critical relationships between figures, specifically congruence and similarity, and proper notation will be stressed. The instructional method and pace anticipate, and are differentiated to accommodate, the learning profile of

students placed into this course. Students who successfully complete this course will be prepared to continue their study of Algebra II in grade 11.
9322: Geometry * Enrollment in this course requires an IEP, TEAM recommendation, and parental consent.

3024: College Preparatory Advanced Algebra 1
This course is offered to sophomores who have completed Honors Geometry as freshmen and require additional Algebra I support as determined by their grade 9 teacher. Aligned with the *Massachusetts Mathematics Frameworks*, this course provides a foundational review of core Algebra topics, including integers, rational numbers, equations and inequalities, exponents and polynomials, factoring, systems of equations and relations, functions and graphs. Students will explore real-world Algebra applications and review a variety of problem-solving strategies. Students who successfully complete CP Advanced Algebra 1 will be placed into CP Algebra II Level 1 in grade 11.

GRADE 11

3030: Honors Pre-Calculus
This course is offered to juniors who have met one of the following criteria: Successfully completed Honors Algebra II and have been recommended by the Honors Algebra II teacher of record. Successfully completed the Virtual High School Algebra II summer course offering with a final average of 85% or better. Eligibility for enrollment in the Virtual High School Algebra II summer course offering requires grade 9 CP Algebra I and grade 10 CP Geometry teacher of record recommendations along with Director of Academic Programs final approval prior to registration. This course is aligned with the *Massachusetts Mathematics Frameworks*. This course covers trigonometry, elementary functions, analytic geometry, and math analysis topics as preparation for calculus. Topics of study also include complex numbers; polynomial, logarithmic, exponential, rational, right trigonometric, and circular functions, and their relations, inverses, and graphs; trigonometric identities and equations; solutions of right and oblique triangles and conic sections.

3031: College Preparatory Algebra II
This course is offered to juniors who have completed either CP Geometry or CP Advanced Algebra I in 10^{th} grade and who have received the recommendation of their 10th grade mathematics teacher. Aligned with the *Massachusetts Mathematics Frameworks*, this course covers a wide range of topics. After an initial review of the fundamentals of functions and equations from Algebra I, Algebra II students will continue to explore patterns, relations and functions that involve in-depth use of graphs and tables to interpret higher ordered equations and inequalities. Students will be expected to demonstrate understanding of the relevance of mathematical operations in problem solving, communications, and reasoning skills.

3032: College Preparatory Algebra II
This course is offered to juniors who have completed CP Geometry in 10th grade and who have received the recommendation of their 10th grade mathematics teacher. Aligned with the *Massachusetts Mathematics Frameworks*, this course covers a wide range of topics. After an initial review of the fundamentals of functions and equations from Algebra I, Algebra II students will continue to explore patterns, relations and functions that involve in-depth use of graphs and tables to interpret higher ordered equations, and inequalities. Students will be expected to demonstrate an understanding of the relevance of mathematical operations in problem solving, communications, and reasoning skills. The breadth of material is differentiated to accommodate pace of instruction.

3033: College Preparatory Algebra II
This course is offered to juniors who have completed CP Geometry in 10th grade and who have received the recommendation of their 10th grade mathematics teacher. Aligned with the *Massachusetts Mathematics Frameworks*, this course covers a wide range of topics. After an initial review of the fundamentals of functions and equations from CP Algebra I, CP Algebra II students will continue to explore patterns, relations and functions that involve in-depth use of graphs and tables to interpret higher ordered equations, inequalities, and matrices. Students willbe expected to demonstrate understanding of the relevance of mathematical operations in problem solving, communications, and reasoning skills. The breadth of material is differentiated to accommodate pace of instruction.
9332: Algebra II * Enrollment in this course requires an IEP, TEAM recommendation, and parental consent.

GRADE 12

3MAT177: Statistics, Concurrent Enrollment
Statistics is a concurrent enrollment course taught through Middlesex Community College by Shawsheen Mathematics faculty in the students' regular academic schedule. This is a general statistics course, which includes understanding data, measures of central tendency, measures of variation, binomial distributions, normal distributions, correlation and regression probability and sampling distributions, Central Limit Theorem, confidence intervals, estimates of population parameters and hypotheses testing. Interpretation and data analysis are emphasized. Students in this course will receive both high school and college credit. Students must meet the following pre-requisites to enroll in this course: Score of 480 or higher on PSAT or SAT Evidence Based Reading and Writing, a grade of 85% or better in his/her 11th grade English course, a grade of 85% or better in Algebra II, and at least a 3.0 high school grade point average.

3MAT290: Calculus I for Science and Engineering, Concurrent Enrollment
Calculus I for Science and Engineering is a concurrent enrollment course taught through Middlesex Community College by Shawsheen Mathematics faculty in the students' regular academic schedule. This course offers a review of functions including conics and trigonometric functions and their graphs; regression models; finding limits, the properties of limits; the delta-epsilon limit definition; continuity; the limit definition of derivatives, the derivatives of algebraic, trigonometric, logarithmic and exponential functions; implicit differentiation; related rates; the Mean Value Theorem; L'Hopital's Rule; applications such as velocity and acceleration; curve sketching using the first and second derivative tests; optimization problems; differentials and Newton's Method; and antiderivatives. Additional topics may include sigma notation, Reimann sums and integrating with the Fundamental Theorem of Calculus. Students must meet the following pre-requisites to enroll in this course: Score of 480 or higher on PSAT or SAT Evidence Based Reading and Writing, a grade of 85% or better in his/her 11th grade English course, a grade of 85% or better in 11th grade Honors Pre-Calculus 3030 and at least a 3.0 high school grade point average.

3041: College Preparatory Pre-Calculus
This course is offered to seniors who completed CP Algebra II or who have been recommended by their 11th grade mathematics teachers. Aligned with the *Massachusetts Mathematics Frameworks*, this course combines the study of Trigonometry, Elementary Functions, Analytic Geometry, and Math Analysis topics as preparation for Calculus. Like Calculus, this course targets students whose post-secondary plans include an undergraduate concentration in Engineering, Science, Mathematics, Computer Science, or Business.

3045 CP Function Analysis and Trigonometry
This course is offered to seniors who have completed Algebra II and have been recommended by their 11th grade mathematics teacher. Aligned with the *Massachusetts Mathematics Frameworks*, this course furthers the study of higher order functions, including domain and range represented in set and interval notation, compositions of and operations with functions, odd and even functions, transformations, and symmetry. Students will explore the unit circle, be introduced to the six trigonometric functions, calculate exact values in both degrees and radians, and graph trigonometric functions.

3042: College Preparatory Statistics
This course is offered to seniors who have completed Algebra II and have been recommended by their 11th grade mathematics teacher. Aligned with the *Massachusetts Mathematics Frameworks*, this course includes an introduction to statistical concepts, probability, frequency distributions, sampling, testing of hypotheses and linear regression. This course will emphasize the practical applications of statistics and the analysis of data rather than mathematical derivations of formulas.

3043: College Preparatory Statistics and Trigonometry
Aligned with the *Massachusetts Mathematics Frameworks*, this course is offered to seniors who have completed Algebra II and have been recommended by their 11th grade mathematics teacher. The course includes an introduction to basic Statistics, Probability and Trigonometry. Concepts are formula and application based with an emphasis on problem solving strategies and quantitative reasoning. The breadth of material is differentiated to accommodate pace of instruction.

3044: CP Mathematical Applications
This course is offered to seniors who have completed Algebra II and have been recommended by their 11th grade mathematics teacher. Aligned with *Massachusetts Mathematics Frameworks*, this course includes a section on financial practices to reinforce and/or introduce the topics of ratios, rates, proportions, percent, taxes, and interest and will provide students with opportunities to apply them to real life situations. This course will also engage students in problem solving using various methods of indirect measurement techniques in trigonometry. Concepts are formula and application based with an emphasis on problem solving strategies and real-life applications. The course will also offer practice to reinforce core measurement concepts such as area, scale factor, scale drawings and models.
9344: Mathematical Applications * Enrollment in this course requires an IEP, TEAM recommendation, and parental consent.

Science Course Descriptions

Students at Shawsheen are required to take and pass two (2) years of science, and a third (3rd) year of social studies or science. Freshman, sophomore, junior and senior science are offered at the honors, college preparatory and support services levels. Additionally, two Concurrent Enrollment courses are offered during junior and senior year. Placement into each of the levels is determined by standardized comprehension scores, writing scores, and by teacher recommendation.

GRADE 9
5011: Honors Lab Cell Biology
This course is offered to freshmen who have demonstrated readiness for this course measured by their performance on aspects of the ninth-grade ELA Entrance Placement Exams. Aligned with the

Massachusetts Science and Technology Engineering Frameworks, this course—followed by sophomore Lab Biodiversity – will broaden student understanding of the chemistry of life, cellular biology, anatomy and physiology, and ecology. Critical thinking skills will develop through pre- and post-activities, discussions, and lab reports. Microscopes and computers will be used to enrich laboratory work and scientific investigation. Students will be expected to respond to this high-rigor curriculum individually as well as collaboratively on projects designed to provide further evidence of standard attainment.

5012 and 5013: College-Preparatory Lab Cell Biology
These courses are offered to freshman based on their performance on aspects of the ninth-grade's ELA and Entrance Placement Exams. Aligned with the *Massachusetts Science and Technology Engineering Frameworks*, these courses—followed by sophomore Lab Biodiversity– will broaden student understanding of the chemistry of life, cellular biology, anatomy and physiology, and ecology. Critical thinking skills will be developed through pre- and post-activities, discussions, and lab reports. Microscopes and computers will be used to enrich laboratory work and scientific investigation. Students will be expected to work individually as well as collaboratively on projects designed to provide further evidence of standard attainment.
9511: Cell Biology * Enrollment in this course requires an IEP, TEAM recommendation, and parental consent.

GRADE 10
5021: Honors Lab Biodiversity
This course is offered to sophomores who earned a final grade of at least a C+ in Honors Cell Biology or at least a B in CP Cell Biology (Level 2) and are placed in ELA Level 1, 2 or 3 and receive a recommendation from their current science teacher. Aligned with the *Massachusetts Science and Technology Engineering Frameworks*, this course completes the biology standards introduced in grade 9 and prepares students for the Biology MCAS examination at the end of grade 10. Students will study the principles of genetics as well as the interrelationship and effect of evolution on biodiversity in the populations of living things. Critical thinking skills will be developed through pre- and post-activity discussions and lab reports. Microscopes and computers will be utilized to enrich laboratory work and scientific investigation. Students will be expected to respond to this high-rigor curriculum individually as well as collaboratively on projects designed to provide further evidence of standard attainment.

5022 and 5023: College Preparatory Lab Biodiversity
These courses are offered to sophomores based on their performance in their 9th grade Cell Biology and and aligns with the *Massachusetts Science and Technology Engineering Frameworks*. This course completes the biology standards introduced in grade 9 and prepares students for the Biology MCAS examination at the end of grade 10. Students will study the principles of genetics as well as the interrelationship and effect of evolution on biodiversity in the populations of living things. Executive functioning and higher order thinking skills are developed and applied throughout the course. Microscopes and computers may be utilized to enrich laboratory work and scientific investigation. Students will be expected to respond to this high-rigor curriculum individually as well as collaboratively on projects designed to provide further evidence of standard attainment.
9522: Biodiversity and Ecology * Enrollment in this course requires an IEP, TEAM recommendation, and parental consent.

GRADE 11
5CHE121J: Intro to Chemistry, Concurrent Enrollment
Intro to Chemistry is a concurrent enrollment course taught through Middlesex Community College by

Shawsheen Science faculty in the students' regular academic schedule. This course covers the basic principles of chemistry, including metric measurement, properties of matter, atomic structure, chemical bonding, stoichiometry, and solutions with emphasis on the usefulness of the periodic table in predicting chemical behavior. This class is designed primarily for students with no previous chemistry courses. The laboratory includes an experimental study of the chemical principles. Students in this course will receive both high school and college credit. Students must meet the following pre-requisites to enroll in this course: Score of 480 or higher on PSAT or PSAT 10 Evidence Based Reading and Writing, a grade of 85% or better in Level 1, 2 or 3, 10th grade English, a grade of 80% or better in 10th grade Honors Algebra II or a grade of 90% or higher in Level 2 10th grade Geometry and 90% or higher in Level 2 9th grade Algebra 1, at least 3.0 high school grade point average, and teacher recommendation.

5032: **College Preparatory Lab Chemistry**
This course is offered to juniors who have successfully completed Cell Biology and Biodiversity, are currently enrolled in Honors Precalculus or Algebra II Level 2 or 3 or receive a recommendation from a past science teacher. Aligned with the *Massachusetts Science and Technology Engineering Frameworks* this course covers matter and its classification, atomic structure, bonding and nomenclature, chemical reactions and stoichiometry, equilibrium, acids and bases, and the gas laws. Laboratory activities will be used to further develop students' understanding of the content. Students will apply and advance their scientific abilities including constructing and applying models, computational thinking, and analyzing and interpreting data.

5034: College Preparatory Lab Physical Science
This math-based science course is a survey of principals and concepts from physics and chemistry and includes laboratory experimentation and problem-solving applications. Units of study include review of the scientific method, matter identification and classification, as well as phase changes, atomic structure, how to read and use the Periodic Table of Elements, how to describe and explain chemical bonding and reactions, graphical analysis of linear motion and fundamental forces, and differentiating the common forms of mechanical energy. Aligns with the *Massachusetts Science and Technology Engineering Frameworks.*

5035: College Preparatory Lab Horticulture
This is a laboratory inquiry-based course where students will understand the structure and function of plants and their importance in our world. Class will focus on independent problem-solving skills and field-based study. Students will obtain skills that are necessary to plant, grow, and tend a garden. During class students will be running a working greenhouse and maintaining a functioning rain garden. The nature of the course requires students to use hand tools and follow all safety protocols established in the classroom.

5036: Conceptual Biology
This course is required for junior students who have not yet passed the Science, Technology and Engineering MCAS Test. Students will learn test-taking strategies along with problem solving and reasoning skills associated with strands of the *Massachusetts Science, Technology, and Engineering Frameworks.* This course focuses on evolution, biodiversity and ecology, the chemistry of life, cell biology, genetics, anatomy and physiology. Computer assisted tutorials will be incorporated into group instruction in an effort to target individual needs. Enrollment in this course requires an administrative recommendation.

GRADE 12

5PHY151: Physics I, Concurrent Enrollment

Physics I is a concurrent enrollment course taught through Middlesex Community College by Shawsheen Science faculty in the students' regular academic schedule. The first in a two-semester algebra/trigonometry-based physics sequence. Emphasis is placed on understanding through problem solving. Topics include the metric system, kinematics, Newton's laws, momentum, energy, power, rotation, temperature and heat. Students in this course will receive both high school and college credit. Students must meet the following pre-requisites to enroll in this course: Score of 480 or higher on PSAT or PSAT 10 Evidence Based Reading and Writing, a grade of 80% or better in 10th grade Honors Algebra II or a grade of 90% or higher in Level 2 10th grade Geometry and 90% or higher in Level 2 9th grade Algebra 1, at least 3.0 high school grade point average, and teacher recommendation.

5041: College Preparatory Lab Physics

This course is offered to seniors who intend to further their education in science, technology, engineering, or mathematics. Trigonometric skills are de-emphasized at this level. This college-preparatory offering and integrates the concepts of physics with hands-on laboratory experimentation and further develops students' scientific inquiry skills. Units of study include motion, forces, momentum, work and energy, and circular motion. Students will be expected to utilize basic trigonometric functions, graphing techniques, and problem-solving strategies. Coursework will involve both individual and collaborative tasks. Successful completion of Algebra I and Geometry is required. Aligns with the *Massachusetts Science and Technology Frameworks.*

5042: College Preparatory Lab Chemistry

This course is offered to seniors who are preparing for admission to four-year colleges and universities. Students must have successfully completed Honors Pre-Calculus or Algebra II Honors, Level 2 or 3 or recommendation from past science teacher to be eligible for this course. Aligned with the *Massachusetts Science and Technology Engineering Frameworks,* this course covers a wide range of topics including the properties of elements, compounds and mixtures, the atomic structure of atoms compared to the periodic table and chemical bonding. A significant portion of the course involves the application of chemical nomenclature, formulas, equations, and product analysis. Matter and its classification, atomic structure, bonding and nomenclature, chemical reactions and stoichiometry, equilibrium, acids and bases, and the gas laws. Laboratory activities will be used to further develop students' understanding of the content. Students will apply and advance their scientific abilities including constructing and applying models, computational thinking, and analyzing and interpreting data.

5048: Honors Anatomy & Physiology

This rigorous course is offered to seniors and is designed for students who intend to study health, medicine, dental or biology after graduation. The course includes a focus on improving student academic reading and study skills, in addition to developing lab skills including dissection and microscopy techniques. The structure and function of the human body is explored through the topics of histology, the skeletal system, the muscular system, and the digestive system. Students must have a science teacher recommendation.

5043: College Preparatory Anatomy & Physiology

This course is offered to seniors and is intended for any student curious about how the human body works. Students will have the opportunity to explore all eleven body systems and how they interact to support

vital human functions. This course will focus on real life applications, diagnoses, and treatments, and will build-on prior lab knowledge and technique.

5047: CP Lab Environmental Science
This project-based course is offered to seniors curious about environmental and climate science. Through case studies and real-world examples, students will investigate the various ways in which humans impact the Earth and explore sustainable solutions to current environmental challenges. Coursework will include both collaborative and independent tasks. Students will design and conduct scientific investigations, think critically to analyze and interpret experimental data, reflect on scientific models, and communicate and defend scientific arguments and explanations.

5044: College Preparatory Lab Physical Science
Aligned with the *Massachusetts Science and Technology Engineering Frameworks*, being a math-based science, this course integrates principles of physics and chemistry with laboratory experimentation and problem-solving applications. Units of study include review of the scientific method, matter identification and classification as well as phase changes, atomic structure, how to read and use the Periodic Table of Elements, how to describe and explain chemical bonding and reactions, graphical analysis of linear motion and fundamental forces, and differentiating the common forms of mechanical energy.
*Students who previously took Chemistry at Shawsheen are ineligible for this course.

5045: College Preparatory Lab Horticulture
This is a laboratory inquiry-based course where students will understand the structure and function of plants and their importance in our world. Class will focus on independent problem-solving skills and field-based study. Students will obtain skills that are necessary to plant, grow, and tend a garden. During class students will be running a working greenhouse and maintaining a functioning rain garden. The nature of the course requires students to use hand tools and follow all safety protocols established in the classroom.

Social Studies Course Descriptions

Students at Shawsheen are required to take and pass two (2) years of social studies, and a third (3rd) year of social studies or science. Freshman, sophomore, junior and senior social studies are offered at the honors, college preparatory and support services levels. Additionally, a Concurrent Enrollment Social Studies course is offered during senior year. Placement into each of the levels is determined by standardized comprehension scores, writing scores, and by teacher recommendation.

GRADE 9
2010: Honors United States History I
Aligned with the *Massachusetts History and Social Science Frameworks*, this course is offered to freshmen who have demonstrated readiness measured by their performance on the ninth-grade Entrance Placement Exams. Students begin their study of United States history with a review of the origins and main events of the American Revolution, Constitutional principles, and events of the early Republic. They examine the causes and consequences of the Civil War, industrialization, immigration, Progressivism, and the role of the United States in World War I. In studying these topics, students apply grades 9–10 reading, writing, and speaking and listening skills, and learn vocabulary and concepts related to history and social

science. As part of the honor's level experience, students are expected to engage in a higher-level of academic rigor and demonstrate a degree of individual responsibility for learning, including timely completion of assignments, preparing for assessments, and engaging instructors for extra help when needed.

2011: College-Preparatory United States History I
Aligned with the *Massachusetts History and Social Science Frameworks*, this course will examine the significance of major periods of our nation's history. Students begin their study of United States history with a review of the origins and main events of the American Revolution, Constitutional principles, and events of the early Republic. They examine the causes and consequences of the Civil War, industrialization, immigration, Progressivism, and the role of the United States in World War I. In studying these topics, students apply grades 9–10 reading, writing, speaking and listening skills, and learn vocabulary and concepts related to history and social science.
9211: United States History I * Enrollment in this course requires an IEP, TEAM recommendation, and parental consent.

4010: College Preparatory 21st Century Civic Literacy
These standards, based in part on the Massachusetts Digital Literacy and Computer Science Standards, are designed to be taught for a quarter to a half of a school year. They examine topics such as analysis of media, and the impact of journalism at various periods of United States history. Students study these topics by exploring and researching guiding questions such as, "Why is a free press essential to democracy?" and "What are principles of responsible journalism? In studying these topics, students apply grade 9 reading, writing, speaking and listening skills, and learn vocabulary and concepts related to history and social science. As part of this course, students engage in a student-led, civics project supporting the development of civic knowledge, skills, and dispositions as defined in the MA DESE History and Social Science Curriculum Framework. Civics learning is the acquisition of knowledge, intellectual skills, and the applied competencies that citizens need for informed and effective participation in civics and democratic life. A non-partisan, student-led civics project is based on action civics—a process of applying civic knowledge, skills, and dispositions to mobilize change leading to systems impact.
9410: 21st Century Civic Literacy * Enrollment in this course requires an IEP, TEAM recommendation, and parental consent. Students in this course must also be enrolled in 9211.

4011: Digital Literacy
Students must be able to effectively use technology to research, organize, create, and evaluate information. In this introductory course, students become familiar with the basic principles of a personal computer, including the internal hardware, operating system, and software applications. Students gain practice in using key applications such as word processing, spreadsheet, and presentation software, as well as understanding social and ethical issues around the Internet, information, and security.
9411: Digital Literacy * Enrollment in this course requires an IEP, TEAM recommendation, and parental consent. Students in this course must also be enrolled in 9211.

GRADE 10
2020: Honors United States History II
Aligned with the *Massachusetts History and Social Science Frameworks* this course is offered to sophomores who demonstrated proficiency in Honors United States History I or who received a teacher recommendation from their grade 9 United States History I teacher. Students continue their study of

United States history of the 20th and 21st centuries. They learn about the economic history of the Great Depression, New Deal, World War II, and the Cold War, concluding with an examination of domestic and global policies and politics in the 21st century. In studying these topics, students apply reading, writing, speaking, and listening standards, and expand vocabulary and concepts related to history and social science. As part of the honor's level experience, students are expected to engage in a higher-level of academic rigor and demonstrate a degree of individual responsibility for learning, including timely completion of assignments, preparing for assessments, and engaging instructors for extra help when needed.

2021: College Preparatory United States History II
Aligned with the *Massachusetts History and Social Science Frameworks*, this course is offered to sophomores who demonstrated proficiency in Honors United States History I or who received a teacher recommendation from their grade 9 United States History I teacher. Students continue their study of United States history of the 20th and 21st centuries. They learn about the economic history of the Great Depression, New Deal, World War II, and the Cold War, concluding with an examination of domestic and global policies and politics in the 21st century. In studying these topics, students apply reading, writing, speaking, and listening standards, and expand vocabulary and concepts related to history and social science.
9233: United States History II * Enrollment in this course requires an IEP, TEAM recommendation, and parental consent.

GRADE 11
2030: Honors Modern World History
Aligned with the *Massachusetts History and Social Science Frameworks* this course is offered to juniors who demonstrated proficiency in Honors United States History II or who receive a teacher recommendation from their grade 10 United States History I teacher. Building on their understanding of world geography and civilizations from middle school, World History I, and US History I and II, students study world history from approximately 1700 to the present by researching guiding questions such as, "What are the connections between industrialization and imperialism?" and "What does it mean to be modern?". As part of the honor's level experience, students are expected to engage in a higher-level of academic rigor and demonstrate a degree of individual responsibility for learning, including timely completion of assignments, preparing for assessments, and engaging instructors for extra help when needed. In studying these topics, students apply reading, writing, speaking, and listening standards, and expand vocabulary and concepts related to history and social science.

2031: College Preparatory Modern World History
Aligned with the *Massachusetts History and Social Science Frameworks* and building on their understanding of USI and USII, students study world history from the French Revolution through the 20th century, concluding with an examination of domestic and global policies and politics in the 21st century. Students explore guiding questions such as, "How has the United States government responded to economic crises?" and "What are the sources of political and cultural differences in the modern United States?" to the present by researching guiding questions such as, "What are the connections between industrialization and imperialism?" and "What does it mean to be modern?" Course activities emphasize organizing information and data from multiple primary and secondary sources, analyzing the purpose and point of view of each source, distinguishing opinion from fact, evaluating the credibility, accuracy, and relevance of each source, and arguing or explaining conclusions, using valid reasoning and evidence then determine next steps and take informed action, as appropriate. In studying these topics, students will apply reading, writing, speaking, and listening standards, and expand vocabulary and concepts related to history

and social science.
9232: Modern World History * Enrollment in this course requires an IEP, TEAM recommendation, and parental consent.

GRADE 12

2GOV120: American Government, Concurrent Enrollment
American Government is a concurrent enrollment course taught through Middlesex Community College by Shawsheen Social Studies faculty in the students' regular academic schedule. This course focuses on an analysis of the political and governmental system of the United States, the principles upon which it is founded, and the institutions and systems which comprise it. An examination of selected social issues and political problems relevant to the American experience is also conducted. This course supports student development of Written and Oral Communications, Critical Thinking, and Social Responsibility. Students will receive both high school and college credit for this course. Students must meet the following pre-requisites to enroll in said course: Score of 480 or higher on PSAT or PSAT 10 verbal; at least 3.0 high school grade point average and teacher recommendation.

2042: College Preparatory America at War
Students in this course will revisit major conflicts throughout American history, focusing on the social, political, and economic causes and consequences. Topics include the American Revolution, War of 1812, Mexican War, Civil War, Spanish-American War, The Great Wars, The Cold War, Korean War, Vietnam War, Gulf War, Iraq War, and the War on Terrorism. In studying these topics, students will apply reading, writing, speaking, and listening standards, and expand vocabulary and concepts related to history and social science.

2043: College Preparatory Legal Issues
In this course, students build on their understanding of American history by examining specific aspects of its legal system. Students will study fundamental principles underlying the U.S. Constitution, Supreme Court Cases, the role law, lawyers, and law enforcement play in our democratic society, and analyze case studies illustrating legal issues and processes in the context of real-life situations. Students will also explore topics related to Genocide and Mass Atrocities through both International and American law, the politics of difference, terrorism, and the legal consequences associated with war crimes. Throughout the course, students engage in critical thinking and reasoning, problem solving, and role playing while making connections to contemporary legal problems. In studying these topics, students will apply reading, writing, speaking, and listening standards, and expand vocabulary and concepts related to history and social science.
9243: Legal Issues* Enrollment in this course requires an IEP, TEAM recommendation, and parental consent.

2044: College Preparatory Introduction to Psychology
This course is offered to seniors who demonstrated proficiency in Biology or Anatomy- Physiology and will introduce those enrolled to concepts examined from several perspectives in modern psychology: the biological, evolutionary, cognitive, behavioral, psychodynamic, humanistic, and sociocultural. Units of study will include analysis of scientific methodology in collection of empirical data, evaluation of ethical considerations in research, and how rigor in each are essential to an understanding of historical psychological research. This course provides an overview of psychology, defining the social science discipline as the scientific study of the mind and behavior, and seeks to provide students with the

opportunity to consider such perspectives within and applicable to their everyday lives. In studying these topics, students will apply reading, writing, speaking, and listening standards, and expand vocabulary and concepts related to history and social science.

2050: College Preparatory Modern World
Aligned with the *Massachusetts History and Social Science Frameworks* and building on their understanding of USI and USII, students study world history from the French Revolution through the 20th century, concluding with an examination of domestic and global policies and politics in the 21st century. Students explore guiding questions such as*, "How has the United States government responded to economic crises?"* and *"What are the sources of political and cultural differences in the modern United States?"* to the present by researching guiding questions such as, *"What are the connections between industrialization and imperialism?"* and *"What does it mean to be modern?"* Course activities emphasize organizing information and data from multiple primary and secondary sources, analyzing the purpose and point of view of each source, distinguishing opinion from fact, evaluating the credibility, accuracy, and relevance of each source, and arguing or explaining conclusions, using valid reasoning and evidence then determine next steps and take informed action, as appropriate. In studying these topics, students will apply reading, writing, speaking, and listening standards, and expand vocabulary and concepts related to history and social science.

2048: College Preparatory Untold History
Students enrolled in this course will investigate more obscure historical topics as they relate to social, political, and economic issues of the time. The course examines both local and national events such as the Kennedy Assassination, the Gardner Heist, the Boston Molasses Disaster, obscure individuals from broader topics, and historical investigations from local towns.

2046: College Preparatory Digital Literacy II
This course aims to expand upon the skills introduced during Digital Literacy I to help prepare students for adult life in a competitive, technologically driven world. Students further their understanding of the internal hardware, operating system, and software applications of their personal computers. Students gain applicable skills through exploring digital tools and achieve an understanding of social and ethical issues around the Internet, social media information, professional networking and security.

4030: College Preparatory Personal Financial Literacy and Economics
This course is designed to provide students with a comprehensive understanding of personal financial literacy and economics, as outlines in the *Massachusetts State Education Frameworks*. Through a combination of theoretical concepts and practical application, students will develop the knowledge and skills necessary to make informed financial decisions and understand the broader economic forces that shape our world. The course will cover key topics such as budgeting, savings, investing, credit management, and financial planning.
Students in the Business Technology Program are not eligible to take this course

Physical Education and Wellness Course Descriptions

Students at Shawsheen are required to take and pass four (4) years of Physical Education and Health Education.

GRADE 9

6100: Physical Education

Aligned with selected standards of the *Massachusetts Comprehensive Health/Physical Education Frameworks*, the ninth-grade program focuses on Shawsheen's aquatic center, gymnasium, turf athletic fields and state-of-the-art Fitness Center provide students with a variety of opportunities to maintain and develop their individual physical fitness. Physical activities are goal oriented to create self-awareness and prepare for a lifelong of personal wellness. Throughout the Physical Education Program, teachers help students develop and exercise a sense of personal responsibility. Each student is expected to monitor and assess his or her health and fitness levels regularly in preparation for adulthood. Through exercise, students will build confidence, reduce anxiety, and create flourishing mental acuity. Concepts such as: dynamic stretching, muscular endurance, cardiovascular awareness, interval training, metabolic conditioning and plyometrics will be explored. The aquatics component will be one quarter and consist of performance of basic swim stroke development, survival techniques and water safety awareness.

6101: Health Education

Aligned with selected standards of the *Massachusetts Comprehensive Health/Physical Education Frameworks*, the ninth-grade program focuses on Shawsheen's comprehensive health curriculum presents students with tools and knowledge needed to prepare them to make informed personal health decisions. In the 9th grade, students participate in our substance abuse prevention curriculum, some of the included topics are teen brain development and why teens are more prone to addiction, alcohol abuse, popular recreational drugs use/abuse, the dangers of opioids in our community and healthy coping strategies in our ever-changing world.

GRADE 10

6200: Physical Education

Aligned with selected standards of the *Massachusetts Comprehensive Health/Physical Education Frameworks,* the tenth-grade program focuses on Shawsheen's aquatic center, gymnasium, turf athletic fields and state-of-the-art Fitness Center provide students with a variety of opportunities to maintain and develop their individual physical fitness. Physical activities are goal oriented to create self-awareness and prepare for a lifelong of personal wellness. Throughout the Physical Education Program, teachers help students develop and exercise a sense of personal responsibility. Each student is expected to monitor and assess his or her health and fitness levels regularly in preparation for adulthood. Through exercise, students will build confidence, reduce anxiety, and create flourishing mental acuity. Concepts such as: team unity, building trust, bonding, healthy competition, resolving conflicts, improving culture and team play will be explored. The aquatics component will be one quarter and consist of performance of continued swim stroke development, survival techniques and a variety of water games.

6201: Health Education

Aligned with selected standards of the *Massachusetts Comprehensive Health/Physical Education Frameworks,* the 10th grade Health curriculum introduces students to medically accurate, age- appropriate, and inclusive sexuality education. Understanding trust, consent, identifying the differences between healthy and unhealthy relationships, clarity on LGBTQIAT+ issues and new terminology. In addition to learning about abstinence, students will understand how to prevent unwanted pregnancy and sexually transmitted infections in intimate relationships.

GRADE 11

6300: Physical Education

Aligned with selected standards of the *Massachusetts Comprehensive Health/Physical Education Frameworks,* the eleventh-grade program focuses on Shawsheen's, gymnasium, turf athletic fields and state-of-the-art Fitness Center provide students with a variety of opportunities to maintain and develop their individual physical fitness. Physical activities are goal oriented to create self-awareness and prepare for a lifelong of personal wellness. Throughout the Physical Education Program, teachers help students develop and exercise a sense of personal responsibility. Each student is expected to monitor and assess his or her health and fitness levels regularly in preparation for adulthood. Through exercise, students will build confidence, reduce anxiety, and create flourishing mental acuity. Concepts such as: self-guidance, emotional wellness, self-pacing, self-monitoring, lifelong wellness skills and individual sports will be explored.

6301: Health Education

Aligned with selected standards of the *Massachusetts Comprehensive Health/Physical Education Frameworks,* the eleventh grade, students take a closer look at teen dating relationships; topics included are identifying the qualities of healthy/unhealthy relationships, conflict mitigation and self-advocacy. Making safe and healthy decisions in intimate relationships, fluency in consent, understanding life-changing risks such as sexually transmitted infections and unplanned pregnancy. In addition, students will gain greater understanding of the evolution of gender and LGBTQIAT+ issues.

GRADE 12

6400: Physical Education

Aligned with selected standards of the *Massachusetts Comprehensive Health/Physical Education Frameworks,* the twelfth-grade program focuses on Shawsheen's, gymnasium, turf athletic fieldsand state-of-the-art Fitness Center provide students with a variety of opportunities to maintain and develop their individual physical fitness. Physical activities are goal oriented to create self-awareness and prepare for a lifelong of personal wellness. Throughout the Physical Education Program, teachers help students develop and exercise a sense of personal responsibility. Each student is expected to monitor and assess his or her health and fitness levels regularly in preparation for adulthood. Through exercise, students will build confidence, reduce anxiety, and create flourishing mental acuity. Concepts such as: self-guidance, emotional wellness, self-pacing, self-monitoring, lifelong wellness skills and individual sports will be continued.

6401: Health Education

Aligned with selected standards of the *Massachusetts Comprehensive Health/Physical Education Frameworks,* the twelfth-grade, students reflect on the culmination of knowledge developed overthe past 3 years. Students will spend time understanding personal bias and will be encouraged to share their opinions on various health topics in a manner expected of an emerging adult. Practicing communication and advocacy skills is the focus in students' senior year. In addition,students will revisit topics such as: prevention of substance use and abuse, understanding addiction, management of stress, the differences between healthy and unhealthy relationships.

6441: Weight and Cardio Training

This course is offered to seniors and is designed to give students the opportunity to learn fitness concepts and conditioning techniques used for obtaining optimal physical fitness. Students will benefit from comprehensive weight training and cardiorespiratory endurance activities. Students will learn the

fundamentals of strength training, aerobic training, and overall fitness training and conditioning. The course includes both lecture and activity sessions. Students will be empowered to make wise choices, meet challenges, and develop positive behaviors in fitness, wellness, and movement activity for a lifetime.

6442: Team Games & Outdoor Adventures
This course is offered to seniors and is designed to enhance personal fitness skills and knowledge of team games and outdoor adventures. Students will engage in activities which enhance a healthy mind and body while being introduced to the beautiful surroundings in the area. Activities will focus on empowering students to make choices and developing lifelong positive behaviors in wellness and movement. Activities may include hiking, orienteering, snow shoeing, breathing exercises, meditation, pickle ball, tennis, volleyball, badminton, environmental cleanup, etc. Students will be required to go outside each class unless it is below 20 degrees. Requirement: Warm jacket, boots, hat, and gloves during colder weather.

6431: Living Well
This classroom and open-space course will introduce students to new ways of living a healthy life. Incorporating mindfulness, meditation, and yoga for stress management. Students will also work on communication skills, self-advocacy, and leadership activities throughout the duration of the class. Some activities may include team building games, personal reflection, community engagement and taking actionable steps to healthier living.

World Language Course Descriptions

4031/4041: College Preparatory Spanish I
Spanish I introduces students to the Spanish language and culture. Vocabulary will be developed through listening, speaking, reading, and thinking activities. Students will learn basic grammatical structures in order to write and converse in the context of practical and meaningful situations.

4032/4042: College Preparatory Spanish II
Spanish II is intended for students who have successfully completed Spanish I. Emphasis will be placed on expanding vocabulary and on increasing the ability to speak, read, write, and comprehend the language. Student learning will be assessed through a variety of activities including composition and oral reports.

4037/4047: College Preparatory Spanish III
Spanish III is intended for students who have successfully completed Spanish II. The course is built upon the foundation laid in Spanish I and II, aiming to further develop students' proficiency in the Spanish language. The course continues to focus on the four key language skills: listening, speaking, reading, and writing. Students will expand their vocabulary, strengthen their grammar skills, and deepen their understanding of Spanish grammar rules and sentence structures. Cultural enrichment is an integral part of the course, with students exploring the diverse cultures of Spanish-speaking countries through literature, art, film, music, and current events.

4033/4043: College Preparatory Spanish I (summer course)
This intensive summer course is offered to students during the summers before the start of their senior and

junior years of high school, pending enough student interest. Spanish I introduces students to the Spanish language and culture. Vocabulary will be developed through listening, speaking, reading, and thinking activities. Students will learn basic grammatical structures in order to write and converse in the context of practical and meaningful situations.

4034/4044: College Preparatory Spanish II (summer course)
This intensive summer course is offered to students during the summers before the start of their senior and junior years of high school, pending enough student interest. Spanish II is intended for students who have successfully completed Spanish I. Emphasis will be placed on expanding vocabulary and on increasing the ability to speak, read, write, and comprehend the language. Student learning will be assessed through a variety of activities including composition and oral reports.

4035/4045: College Preparatory Spanish I (after-school course)
This course is offered to students after school hours, pending enough student interest. Spanish I introduces students to the Spanish language and culture. Vocabulary will be developed through listening, speaking, reading, and thinking activities. Students will learn basic grammatical structures in order to write and converse in the context of practical and meaningful situations.

4034/4046: College Preparatory Spanish II (after-school course)
This course is offered to students after school hours, pending enough student interest. Spanish II is intended for students who have successfully completed Spanish I. Emphasis will be placed on expanding vocabulary and on increasing the ability to speak, read, write, and comprehend the language. Student learning will be assessed through a variety of activities including composition and oral reports.

Support Services Course Descriptions

GRADE 11

9030: Postsecondary Transition Planning I
This course is only offered to juniors who have an IEP, TEAM recommendation, and parental consent. This course is designed for students with diagnosed disabilities who need additional support and instruction to assist with decision making about their career paths and to begin to create a plan for their future work, education, or training options. This course will utilize the support of staff from Massachusetts Rehabilitation Commission and/or MassHire and will follow the Pre-Ets curriculum. Additional documentation may be required. Core concepts covered include:

- Job exploration and counseling
- Workplace readiness training
- Work-based learning experiences
- Counseling on post-secondary education or training
- Self-advocacy and peer mentoring

Weekly lessons encompass a variety of topics, including accessing available supports, exploring educational and employment opportunities/options, and understanding employment rights. Post high school living, and community involvement options are also covered.

9031: Academic Support
Determination of need for Academic Support class is based upon recommendations made at the student's Individualized Education Program (IEP) Team meeting. Students in need of continued development of independent work habits may be recommended for this class. Students must have a diagnosed disability, be enrolled in all mainstream college preparatory classes, and have a significant deficit in executive functioning skills that impacts their ability to demonstrate effective progress in multiple areas. The student has experienced failure due to extreme lack of executive functioning skills, not attributed to lack of effort; requires continued instruction in executive function skills and strategies.

GRADE 12

9040: Postsecondary Transition Planning II
This course is only offered to seniors who have an IEP, TEAM recommendation, parental consent and who have completed Postsecondary Transition Planning I. This course builds on the eleventh-grade course Postsecondary Transition Planning I and is designed for students with diagnosed disabilities who need continued support and instruction to assist with decision making about their career paths and to solidify a plan for their future work, education, or training options. This course will utilize the support of staff from the Massachusetts Rehabilitation Commission (MRC) and/or MassHire and will follow the Pre-Ets curriculum. Additional documentation may be required. Core concepts covered include:

- Job exploration and counseling
- Workplace readiness training
- Work-based learning experiences
- Counseling on post-secondary education or training
- Self-advocacy and peer mentoring

Weekly topics specific to Postsecondary Transition Planning II include; Managing Money and Finances, College Resources, Voting, Scholarship Applications, College Essays, College Resources, and Requesting Disability Resources.

9041: Academic Support
Determination of need for Academic Support class is based upon recommendations made at the student's Individualized Education Program (IEP) Team meeting. Students in need of continued development of independent work habits may be recommended for this class. Students must have a diagnosed disability, be enrolled in all mainstream college preparatory classes, and have a significant deficit in executive functioning skills that impacts their ability to demonstrate effective progress in multiple areas. The student has experienced failure due to extreme lack of executive functioning skills, not attributed to lack of effort, and requires continued instruction in executive function skills and strategies.

Career & Vocational-Technical Education (CVTE) Programs

Ninth-Grade Exploratory

The ninth-grade exploratory, related, and shop courses are designed (a) to effectively prepare ninth-grade students for responsible, productive citizenship, and (b) to meet the competencies identified in the Department of Elementary and Secondary Education's *Vocational Technical Educational Frameworks*. Additionally, the complementary related and shop curricula provide students with both theoretical knowledge and practical, hands-on learning experiences. In this manner, the exploratory program provides a broad exposure to Shawsheen's twenty-four vocational and technical areas (offered in twenty shop settings) and an objective basis on which the student selects and prepares for a career in a licensed trade, technology, or skilled occupation.

Advanced Manufacturing Technology

Grade 9 Exploratory

The Freshman Exploratory is designed to give students a safe, hands-on experience. Using shop equipment such as manuals, CNC lathes and milling machines, students fabricate various entry-level projects. They also gain experience using micrometers, saws, belt sanders, and buffing wheels. Shop safety and proper equipment use are emphasized throughout this program through teacher demonstrations, lecture, and class materials.

8216: Grade 10 Shop

Advanced Manufacturing Technology sophomores receive training through project-based activities with hands-on experiences. Concepts of Quality Control - Measuring/Inspection and understanding tolerances is an essential skill learned. Students will build and assemble products according to detailed drawings and annotated hand sketches. Using shop developed projects and tasks, students will perform machining operations that are relevant to a multitude of machines including lathes and milling machines. The use of hand tools, measuring tools, inspection and setup of machines are also included in each daily lesson. Students will demonstrate safe operation of equipment, following the rules of the shop. Fourth quarter students are introduced to the shop's state-of-the- art Computer Numerical Control (C.N.C.) equipment, building on the skills attained on the manually operated equipment they have been using throughout the year.

7216: Grade 10 Related

The theory, concepts and the fundamental building blocks of shop equipment set up and operation are examined that include; milling, drilling, turning, grinding, and types of cutting tools. The curricula also include; identifying types of metals and advanced materials. (i.e., carbon fiber, plastics, composites), describing heat treatment processes: harden, temper, anneal, normalize, and case harden, formulate an order of operations, proper tooling, and work-holding devices, with plan production process, and LEAN principles being discussed. Clean room and climate-controlled environments and their purpose in the Manufacturing Industry are discussed, as well as print reading, measurement, dimensions, screw threads, non-traditional machining, and machine tool safety.

8316: Grade 11 Shop

Students will demonstrate their skill level in the turning, set up and milling of shapes and surfaces of

cylindrical and square stock through the completion of shop designed projects and tasks. The operations of finishing processes for the completion of a product will also be part of the overall objective. Through the selection of appropriate work holding devices, students will demonstrate a working knowledge set up and fixtures needed for the completion of machining processes. Students will continue to build and expand their skills to a higher level in terms of both accuracy and proficiency. Mastercam computer-aided design software in conjunction with CNC Millers and Lathes will be included in most of the project-based activities. Juniors take an active role within the school by taking on repair work throughout the building and the district, both in terms of parts repair and replication and fabrication of new parts. Manufacturing Advancement Center Workforce Innovation Collaborative (MACWIC) and the10-hour OSHA General Safety certifications are also part of the curricula.

7316: Grade 11 Related
The concepts of the following standards of machine tools and safety, principles of linear measurement, measurement dimensions and tolerances, dial indicators, inspection of surface finish, flatness and shape, setup tools, screw threads, taps and dies, stock cutoff machines, drills and drilling machine operations, lathe and cutting tools and tool holders, and cutting speeds are the main topic within the curricula. Students also read and interpret detail drawings to meet American National Standards Institute (ANSI) and International Organization for Standards (ISO) standards, blueprint reading and applied mathematics. The classroom theory provides students a chance to demonstrate a working knowledge of a written program and the different codes that are associated with Mastercam X software.

8416: Grade 12 Shop
Students will demonstrate the operation of the control panel to set up, run, and edit a program for a shop designed project, using Manual Data Input (MDI) and control panel operations including simple programming, tool changes and spindle speeds. Various aspects of CNC, particularly operations of CNC conversational controls will be the essential standards presented senior year. Students also study advanced production requirements. Co-op programs are available for qualified students to train in industry.

7416: Grade 12 Related
Using a two-pronged approach, students will use industry standard CNC equipment and classroom theory to demonstrate a working knowledge of a written program and the different
codes that are associated within it. Activities with Mastercam X and defining and converting files to generic formats i.e. (.pdf, .dxf, .igs, .stp, .stl, etc.). G and M Code to produce parts will be an essential part of the curricula. Students also continue their studies in advanced machine tool technology theory and review blueprint reading. Discussion of issues and questions brought back by CO-OP students will be part of a weekly class. Careers and educational opportunities will be reviewed, identifying the current job market available to them upon graduation. Strands 4and 5 Management and Entrepreneurship Knowledge and Skills & Employability and Career Readiness will be implemented throughout the curricula. Some of the standards include; Career Exploration and Navigation, Work Ethic and Professionalism, Legal/Ethical/Social Responsibilities, define entrepreneurship and be able to recognize and describe the characteristics of an entrepreneur.
Licensing/Certifications: General Industry OSHA 10-hour Outreach Training Card, Manufacturing Advancement Center Workforce Innovation Collaborative (MACWIC) Certifications – Levels 1 & 2. Some additional fees may apply, including certification exams, state licensing exams, and industry-recognized credentials.

Automotive Collision Repair & Refinishing

Grade 9 Exploratory
The student going through the 9th grade exploratory gains a working experience in the basic skills needed in the collision repair and refinishing field, as well as the tools and applications of those procedures. The use of visual demonstrations as well as hands on experience provides students with an excellent introduction to a career in collision repair technology.

8202: Grade 10 Shop
The 10th grade collision repair program provides the student with the opportunity to acquire skills in the following areas: shop and personal safety procedures; MIG and oxyacetylene welding and cutting; care and use of power tools, hand tools, and shop equipment; analyzing, repair of collision damage and replacement of auto glass. Students gain experience working on customers' automobiles in a shop environment that simulates a commercial auto body shop.

7202: Grade 10 Related
The theory related to the varied aspects of collision repair technology is covered in this course, including MIG and oxyacetylene welding, cutting, brazing, and power and hand tool use, particularly spray equipment. Students also gain knowledge of the history of auto body and frame construction, analysis, and repair of metal damage, including panel replacement, and spraying of both color and clear coats. Glass replacement is also covered.

8302: Grade 11 Shop
The 11th grade program provides the students with a more in-depth study of collision repair and automotive refinishing techniques and equipment. The students analyze and repair areas of collision damage including frame and unit body repair utilizing the chief frame and laser beam alignment frame repair system. Students also work on fiberglass and plastic body repair projects, repair electric systems, provide front suspension service, and refinish automotive exteriors, becoming proficient in the proper use and set up of the well-built downdraft spray booth.

7302: Grade 11 Related
The 11th grade related program encompasses a much more in-depth study of collision repair and spraying techniques. This course also includes analysis and repair of different areas of collision damage; types and proper uses of frame machines and hydraulic equipment; frame straightening and alignment; fiberglass body repair; repair of auto air conditioner and electrical systems; and front suspension service.

8402: Grade 12 Shop
The 12th grade program provides the student with complete coverage of advanced auto body repair, both major and minor, as well as the most advanced types of paints used and proper application methods. Other areas covered in this course include analysis and repair of major collision damage; MIG welding; major frame repair; determining when to repair or replace parts; estimating and preparing for job interviews. The 12th grade student may also be eligible to enter

the co-op program, gaining valuable on-the-job experience in local collision repair shops. Strands 4 and 5 Management and Entrepreneurship Knowledge and Skills & Employability and Career Readiness will be implemented throughout the curricula. Some of the standards include; Career Exploration and Navigation, Work Ethic and Professionalism, Legal/Ethical/Social Responsibilities, define entrepreneurship and be able to recognize and describe the characteristics of an entrepreneur.

7402: Grade 12 Related
The senior related student becomes proficient in advanced auto body repair theory, both major and minor. The most up to date types of paints used today are reviewed as well as methods of application and trouble-shooting paint problems. Other areas covered are analyzing and repairing major collision damage; MIG welding; major frame repairs; commercial equipment repairs; proper methods of towing vehicles; determining when to repair or to replace parts; estimation preparation and preparing for job interviews and career success. Strands 4 and 5 Management and Entrepreneurship Knowledge and Skills & Employability and Career Readiness will be implemented throughout the curricula. Some of the standards include; Career Exploration and Navigation, Work Ethic and Professionalism, Legal/Ethical/Social Responsibilities, define entrepreneurship and be able to recognize and describe the characteristics of an entrepreneur.
Licensing/Certification: The Automotive Collision Repair and Refinishing program is affiliatedwith the Inter-Industry Conference on Auto Collision Repair (known as I-CAR), Safety credentials include; SP/2 Safety certifications that include; Collision Repair and Refinishing,
Collision Repair and Refinishing Pollution Prevention, and Tool Management. NFPA's Hot Work Safety Certificate Program, Section 609 A/C Refrigerant Recovery and Recycling (throughthe Mobile Air Conditioning Society). Some additional fees may apply, including certification exams, state licensing exams, and industry-recognized credentials.

Automotive Technology

Grade 9 Exploratory
The exploratory program acquaints freshmen with the many facets of the automotive repair industry. Through rotations in the different areas of the shop, students are exposed to the basic skills needed to perform basic mechanical tasks. Several hands-on maintenance projects on donated vehicles ensure a true hands-on experience for all students. Additionally, students are thoroughly briefed on shop safety issues, particularly tool safety.

8203: Grade 10 Shop
Students are tested on shop safety issues, particularly tool safety. Students work on a mixture of donated automobiles and customer cars, performing increasingly complex automotive repair and maintenance projects. By the end of the school year, sophomores have been exposed to and have experience working in all areas of National Automotive Technicians Education Foundation (NATEF) standards.

7203: Grade 10 Related
Sophomores in Automotive related class begin their coursework with an overview of the automotive industry, along with shop-specific safety information. Also covered are the topics of shop tools and diagnostic equipment, including features and use information. Sophomore related

students will cover steering, suspension, vehicle alignments and braking systems, as well as hydraulic system theory and operation.

8303: Grade 11 Shop
Junior students work exclusively on donated or customers' automobiles; honing the basic skills they learned as sophomores. They are assigned to increasingly complex projects and begin to increase both the quality and pace of their work. In addition, students will have the opportunity to perform the duties of a service advisor, including communicating with customers and maintaining an electronic customer database.

7303: Grade 11 Related
Junior related students are introduced to electrical and electronic systems. The basics of electrical systems and electronics are reviewed, followed by more in-depth study of automotive batteries, starting systems, charging systems, lighting, ignitions, and electrical instruments and accessories. In addition, an overview of automotive engines is presented including engine blocks, cylinder heads and valves, camshafts and valve trains, intake/exhaust systems, and coolingsystems.

8403: Grade 12 Shop
Senior students become more proficient at a wider range of skills in shop, working on a variety of customers' automobiles, focusing on the various specialty areas available to them. Seniors also serve in a leadership role, guiding and mentoring sophomore Automotive students in shop projects. Students who qualify often choose to participate in the school's co-op program and are employed by local repair shops during shop week.

7403: Grade 12 Related
Students continue to study automotive systems during their Senior year related class. Students focus on such topics as fuel systems, emissions, on-board diagnostic systems, transmissions, brakes, and automotive HVAC systems. Senior students also acquire more advanced diagnostic and troubleshooting techniques for use in the field. Strands 4 and 5 Management and Entrepreneurship Knowledge and Skills & Employability and Career Readiness will be implemented throughout the curricula. Strands 4 and 5 Management and Entrepreneurship Knowledge and Skills & Employability and Career Readiness will be implemented throughout the curricula. Some of the standards include; Career Exploration and Navigation, Work Ethic and Professionalism, Legal/Ethical/Social Responsibilities, define entrepreneurship and be able to recognize and describe the characteristics of an entrepreneur.
Licensing/Certification: General Industry OSHA 10-hour Outreach Training Card, EPA- Authorized Section 609 Safety Certification, NFPA's Hot Work Safety Certificate Program. The Automotive program is NATEF-certified, and upon graduation and in future employment, students may obtain ASE certification in any of the eight automotive areas and may include their shop hours toward those certifications. Some additional fees may apply, including certification exams, state licensing exams, and industry-recognized credentials.

Business Technology/Marketing

Grade 9 Exploratory

The exploratory program in Business Technology/Marketing introduces the dynamic opportunities in the business industry to freshmen. Included are an interactive introduction to accounting, Microsoft Office, QuickBooks, marketing, social media marketing, entrepreneurship, retail operations, ethics, and web design. Students, through a series of activities and hands-on projects, gain valuable insight on business operations, are introduced to the certifications earned in the program and establish work traits and personal attributes necessary for a rewarding college experience and/or gainful employment in any industry of their choice.

8204: Grade 10 Shop

Sophomores build from their Freshmen Introductory work in Microsoft Office Applications continuing this work in Intermediate-level curriculum with a focus on Excel and Word. Students earn industry- valued Microsoft Office Specialist certifications in these areas of focus prior to the end of sophomore year. *(Microsoft Office Specialist certifications may be applied to university for college credit).* In addition, students gain knowledge of and experience in various business disciplines, including an automated and investigative approach to accounting, marketing, entrepreneurship, and school store operations.

7204: Grade 10 Related

In grade 10 related, students build on freshmen year accounting concepts and receive a solid foundation inthe rigorous accounting course. They will continue instruction related to a sole proprietorship during related week. Sophomores will be introduced to analyzing financial statements and gain insight into executive business decision making regarding expenses, inventory, and balancing the accounting equation. We will cover establishing, maintaining, and reconciling a checkbook, savings accounts, and some investments. Ethics and accounting vocabulary, which is considered to be "The Language of Business", will be infused steadily throughout our students' time in Business Technology/Marketing.

8304: Grade 11 Shop

While continuing to earn Microsoft certifications and further developing accounting skills, the focus shiftsto Business Communications, Career Development, QuickBooks, social media and Sports & Entertainment Marketing. The goal of Business Communications is to develop professional business writing, editing, and formatting skills, whereas Career Development brings students through producing a professional career portfolio while learning and strengthening their interviewing and public speaking skills. The QuickBooks curriculum work leads students to certification opportunities in both the desktop and the online accounting software. Junior level marketing shifts from theory to "hands-on" as students begin learning Google Advertising with several certification opportunities within that. Students perform aterm project working with and presenting to the Marketing Representatives at Patriot Place at Gillette Stadium with a mission to present solutions to real marketing challenges currently being experienced by the organization. Students also continue with accounting studies now devoted to exploring the accounting cycle for a corporation and executive financial analysis and executive business

decision making.

7304: Grade 11 Related
Grade 11 related encompasses the topics of business law and further enhancing accounting skills. During the business law segment, students explore business law curriculum in a broad and comprehensive way exposing students to legal principles of business and civil law, organizational and employment law. The accounting continuity continues for students insuring a deep understanding of the accounting cycle and opportunity in college and the workforce.

8404: Grade 12 Shop
Senior Business & Marketing students focus on Financial Literacy & Management and Microsoft Office. In Financial Management, students sharpen their skills in Personal Financial Literacy, with topics including financing college, saving/investing, retirement, insurance, and purchasing a car and home.
Senior business students dive deeper into the Microsoft certification program by earning "expert" level certifications along with Access and Outlook certifications. They are also responsible for all aspects of managing and operating the School Store which teaches them valuable skills in marketing, advertising,customer service, and entrepreneurship. Those eligible for the school co-op program gain on-the-job experience at a variety of local businesses.

7404: Grade 12 Related
Seniors in related have the opportunity to develop a professional portfolio for use in enhancing their competitive position in the workplace and post-secondary education. Through vibrant differentiated instruction, students continue their discovery of financial knowledge and prove their expertise by passing The WISE Financial Literacy Exam for certification. Additionally, seniors focus on the study of entrepreneurship, including types of business entities, sources of capital, budget, cash flow, and human resource management. Strands 4 and 5 Management and Entrepreneurship Knowledge and Skills & Employability and Career Readiness will be implemented throughout the curricula. Some of the standards include; Career Exploration and Navigation, Work Ethic and Professionalism, Legal/Ethical/Social Responsibilities, define entrepreneurship and be able to recognize and describe the characteristics of an entrepreneur.
Licensing/Certification: General Industry OSHA-Authorized Career Safe ® Online, Microsoft Office Specialist Master Certification: Word, Excel, PowerPoint, & Access.. QuickBooks Certification, WISE Financial Literacy Certification, Google Skillshop: Google Advertising/Google Search Ads Certifications. Some additional fees may apply, including certification exams, state licensingexams, and industry-recognized credentials.

Carpentry

Grade 9 Exploratory
The Exploratory program introduces freshmen to the many career opportunities that exist in the carpentry field. They are instructed on the safe and proper use of hand tools and given a brief

introduction of the portable power tools and stationary power equipment used by carpenters. The students are given safety tests on all power equipment and must pass each test with a 100% in order to use that tool. They are given several measurement assessment activities to check their mathematical aptitude. They spend time handling materials common to the practice and are shown the safe technique for lifting and carrying materials. The freshmen are also introduced to working at heights on a staging to see if they can be comfortable with height.

8205: Grade 10 Shop

The 10th grade Carpentry shop student learns the safe use, operation and maintenance of hand tools, portable power tools, stationary power tools, ladders, and staging/scaffolding that they will be working with in the carpentry field. After satisfactorily completing the shop safety requirements the student moves on to a series of performance tests and projects using all the tools and equipment that they have been trained on. The student progresses from simple tasks on practice projects to the completion of more complex shop projects, including the framing of full mockup house from prints. This is a critical year in their training for the housebuilding program.

7205: Grade 10 Related

The 10th grade Carpentry Related students focus on the safety rules and operation and care of hand tools, portable & stationary power tools, ladders and staging/scaffolding used in the carpentry field. They learn about all the building materials and hardware that they will be working with and the characteristics important to each product. The student learns measurement skills, math skills and trade vocabulary, all which are of great importance to their success in the program.

8305: Grade 11 Shop

The 11th grade Carpentry shop students complete a safety review on all tools and equipment. The focus of their shop experience is on the job training by building a residential home/community-based projects off campus, a valuable opportunity to work on a house from the foundation to the finish. Other training at this level includes sheds, remodeling projects for the school and member communities and practice projects, such as drywall, interior trim, hanging doors, siding, windows, and workstations within the shop.

7305: Grade 11 Related

The 11th grade Carpentry Related students review the safety, proper operation, and care and maintenance of the tools and equipment used in the carpentry field. The students then learn how to locate a building on a piece of land with the use of transits and layout tapes. They also focus on reading and interpreting residential house plans, estimating materials, and calculating final costs for the house. The students are also exposed to the geometry needed for contemporary styling and gable roof design.

8405: Grade 12 Shop

The 12th grade Carpentry shop students review all shop and job site safety. The students gain additional competencies by working on a community house project and are involved in a variety of remodeling jobs in the school and communities. The students spend time in the shop learning specialty roof framing and stairway construction and finish. Students who qualify may be placed out in industry on the co-op program in lieu of shop.

7405: Grade 12 Related
The 12th grade Carpentry students review all shop and job site safety. The student will learn to design residential construction projects utilizing the State Building Codes, to read and interpret the tables and charts and perform the necessary calculations for beam sizes and building loads. The students learn to design the more intricate types of roofs commonly used in New England construction and estimating of costs and materials are taken to a more advanced level this year. Strands 4 and 5 Management and Entrepreneurship Knowledge and Skills & Employability and Career Readiness will be implemented throughout the curricula. Some of the standards include; Career Exploration and Navigation, Work Ethic and Professionalism, Legal/Ethical/Social Responsibilities, define entrepreneurship and be able to recognize and describe the characteristics of an entrepreneur.
***Licensing/Certifications*:** Construction OSHA 10-hour Outreach Training Card**,** NFPA's Hot Work Safety Certificate Program, and credit toward Carpentry Apprentice Program. Some additional fees may apply, including certification exams, state licensing exams, and industry-recognized credentials.

Cosmetology

Grade 9 Exploratory
The Cosmetology Exploratory program exposes students to basic techniques and skills in the Cosmetology field. Students actively participate in practical assignments such as hair braiding, roller setting, shampooing, nail design, and facials. Each freshman receives an individualized hair and nail consultation, and accompanying services, with a junior cosmetology student. This will give the students insight into advanced courses taught within the program. Throughout these activities and demonstrations, students also learn the importance of sanitation, personal hygiene,and professionalism. The students will learn about the various career opportunities within in the field, as well as the state board of Cosmetology licensing requirements.

8207: Grade 10 Shop
Sophomore students study a curriculum designed to introduce them to the fundamentals of hair, skin, and nails. Students work toward successful attainment of specific skills; wet/dry hairstyling, formal styling, hair cutting, clipper cutting, facials, makeup application, manicuring/pedicuring, artificial nail enhancements, and temporary hair removal. Students train in safety procedures on each piece of equipment necessary for a task. Sophomores have salon responsibilities such as greeting clients, booking appointments, and daily/weekly infection control and sanitation.

7207: Grade 10 Related
Sophomores begin their cosmetology related studies in the General Sciences with a focus on infection control, particularly bacteriology, decontamination, and blood borne pathogens. The General Science course of study throughout the year also includes, sciences involving the structure of the hair, skin, and nails, as well as the diseases and disorders of the scalp, skin, and nails. Additionally, students will cover wet hairstyling, blow-dry styling, thermal styling, formal hairstyling, manicuring, pedicuring, artificial nail enhancements, facials, hair removal,

haircutting, and clipper cutting.

8307: Grade 11 Shop
Junior Cosmetology students begin on the clinic floor where services are offered to other students and outside clients by performing services introduced in sophomore year. Junior students begin training in chemical texture services, permanent waving, chemical hair relaxing, hair coloring, bleaching, and foil highlighting. Junior students will learn how to measure and fit a client for wigs and other hair additions. Students observe a multitude of demonstrations by teachers, salon owners, and guest artists to expand upon their experience in these areas.

7307: Grade 11 Related
The junior related curriculum focuses on all cosmetology chemical services. Students investigate the chemical composition and technical application; permanent waving, hair relaxing, hydroxide hair relaxing, thermal hair straightening, hair coloring and hair lightening. The curriculum also includes education on wigs and hair additions. Anatomy, physiology, and chemistry are taught during each subject matter.

8407: Grade 12 Shop
The final shop year is one in which senior students become more proficient in their skills by working on customers and students in the school's salon. Advanced hair styling, haircutting, coloring, color correction, hair lightening, foil highlighting, perming, nail, and skin care are among the services performed. Time is spent preparing students for their state exam as our goal is to have seniors licensed and out on co-op. Our goal is to have seniors licensed and out on cooperative work placement as soon as they complete their 1000-hour training.

7407: Grade 12 Related
A major focus of senior year related is salon management. Students develop a business idea for a salon, incorporating information they have learned regarding levels of shop ownership, accounting and taxation principles, pricing, advertising, and marketing. Students are introduced to additional components of Chemistry and Electricity. Seniors also continue to prepare for the theory portion of the state exam for licensure in cosmetology. Strands 4 and 5 Management and Entrepreneurship Knowledge and Skills & Employability and Career Readiness will be implemented throughout the curricula. Some of the standards include; Career Exploration and Navigation, Work Ethic and Professionalism, Legal/Ethical/Social Responsibilities, define entrepreneurship and be able to recognize and describe the characteristics of an entrepreneur.
Licensing/Certifications: S/P2 Cosmetology for Career-Technical Education Safety Certification. Barbicide® / Infection Control Education Certifications. At the age of fifteen, students begin to accrue hours toward their state licensure. Achieving the require 1000 hours and a final approval from an instructor must be attained to sit for the Massachusetts State Board exam. Some additional fees may apply, including certification exams, state licensing exams, and industry-recognized credentials.

Culinary Arts/Hospitality Management

Grade 9 Exploratory
The Culinary Arts exploratory program introduces the students with the basics of the food service industry and includes time in the culinary arts kitchen/bakery, the Ram's Head dining room and staff dining room, with an emphasis placed on safety. Through rotations in kitchen stations such as the salad department, the hot range area, soup preparation, bakery, the dish room, and the dining room, students are exposed to the basic skills needed to succeed in a commercial kitchen. A full-service restaurant and retail bakery display case give students a true hands-on experience.

8208: Grade 10 Shop
The first full year of the culinary arts program provides an introduction to all aspects of a commercial food service operation. Throughout the school year, students are given the opportunity to develop knife skills and to employ various cooking methods using a full range of recipes that include the use of fresh produce, pasta, meats, dairy, fish, and shellfish. The students will spend some of the time working in our bakery area that sells baked goods to the public in the Ram's Head bakery display case. In addition, they undertake the duties of dining room staff, an experience that provides students with a unique opportunity to explore and develop interpersonal skills and also includes instruction in table set-up, reservations, serving tables, and preparing a guest's check. Throughout the year, instruction in safety and sanitation is emphasized.

7208: Grade 10 Related
This course provides an exceptional opportunity to integrate shop-specific training with core academic subjects. Scaling, the use of measurements, converting recipe yields, and recipe costing are introduced in the classroom and practiced in the kitchen. In addition, the "language of the trade" is developed through written and oral instruction and the science of baking, cooking and the transfer of heat are explored. As safety, personal hygiene, and sanitation procedures are essential elements of any culinary arts program, students receive comprehensive training in the safe use of tools and equipment as well as food handling guidelines that ensure customer safety.

8308: Grade 11 Shop
During junior year, the student's instructional time is spent in kitchen/bakery and the Ram's Head dining room. Their pairing with freshman exploratory students provides them with a unique leadership opportunity. It is a year in which students discover an ability to work with greater independence at a variety of tasks including successful completion of recipes and the set-up of the various kitchen stations with limited assistance. Emphasis is placed on soup and sauce preparation and dry and moist heat cooking methods for poultry, beef, fish, lamb, pork, and veal. In the bakery, advanced breads and pastry production on a commercial scale are practiced. In the dining room, junior students further develop their front-of-the-house skills by taking on the role of host/hostess. In both shop areas, safety and sanitation procedures are reinforced.

7308: Grade 11 Related
Instruction in classical cooking techniques and hospitality management is explored using textbooks, study guides, videos, and demonstrations. Identifying ingredients and exploring methods for preparing salads and dressings, stocks and soups, sauces and gravies are an important element of the year's training, as well as hospitality fundamentals such as service and management, customer outreach, managing cost control, and operational concerns. Additionally, in-depth units of instruction are presented to students in the structure, cuts and cooking methods applied to beef, veal, pork, and lamb. Safety and sanitation procedures, food costing, recipe conversion, and measurement are further reinforced. Guest speakers from Johnson and Wales University, the Culinary Institute of America, and other post-secondary schools provide insight into the opportunities for further education in the Culinary Arts.

8408: Grade 12 Shop
Many eligible seniors opt to participate in the co-op program through which they receive on-site training during school hours at a variety of local restaurants, bakeries, hotels, and health care facility kitchens. In shop, the final year is one in which senior students adopt the role of senior employee. In the kitchen/bakery and Ram's Head dining room, it is anticipated that they will approach a level of independence in their work that demonstrates skill, attention to detail and a strong work ethic.

7408: Grade 12 Related
A senior project is the centerpiece of the final year in the Culinary Arts related program. Student teams design a restaurant concept with an accompanying menu and recipes. Cost analysis, recipe conversion and food cost are the focus of the project. Additionally, a more detailed analysis of the functions of various baking ingredients is studied and the principles of a HACCP (Hazard Analysis Critical Control Point) system are explored in depth. Strands 4 and 5 Management and Entrepreneurship Knowledge and Skills & Employability and Career Readiness will be implemented throughout the curricula. Some of the standards include; Career Exploration and Navigation, Work Ethic and Professionalism, Legal/Ethical/Social Responsibilities, define entrepreneurship and be able to recognize and describe the characteristics of an entrepreneur.
***Licensing/Certifications*:** Allergen Awareness Training, F.O.G., (Fat, Oil, Grease disposal regulation), S/P2 Culinary – Food Safety and Workplace Safety, ServSafe® Certificate. Some additional fees may apply, including certification exams, state licensing exams, and industry-recognized credentials.

Dental Assisting

Grade 9 Exploratory
This weeklong course introduces students to the dental assisting profession. Students are exposed to various principles of clinical, laboratory, and clerical dental assisting. This program allows students to determine whether their abilities and interests are compatible with this technical area. During this course, students explore the many career opportunities in the dental field. Shop safety and program orientation is provided.

Grade 9 Shop
When students enter permanent placement in the Dental Assisting program, the course of study provides an orientation to the dental office. Safety is of the utmost concern and is stressed and practiced during every year of the dental assisting program. Students are introduced to infection control, dental morphology, tooth numbering systems and identification. In addition, basic chairside, laboratory and clerical procedures are taught, with an emphasis on preventative dentistry, oral hygiene instruction, and interpersonal communications.

8224: Grade 10 Shop
Students review and expand upon materials previously studied. Areas of study include Infection Control measures and procedures, preparation for patient care, mouth guard fabrication, patient education, and tooth numbering systems. Students also receive instruction in maintaining patient records, dental instrumentation, chair-side procedures, and responding to patient needs. Anatomy and Physiology with a lab component is also integrated into the curriculum. Students are encouraged to take the Infection Control Examination (ICE), administered by (DANB) the Dental Assisting National Board, (and) Certification in CPR, Basic Life Support is taken.

7224: Grade 10 Related
The Dental Assisting related theory instruction is intended to complement the vocational instruction and laboratory projects taught during the sophomore year in the Dental Assisting program. Topics taught during freshman year will be built upon. In order to prepare for The Dental Assisting National Board Infection Control Examination, infection control and health and safety practices will be a large part of this year's related instruction. Students receive instruction in the areas of microbiology, and management of hazardous materials. Reading, writing, and scientific research assignments related to infectious diseases is integrated in this course.

8324: Grade 11 Shop
During this year considerable instruction in the production of traditional as well as digital dental radiographs is given. Components of the dental x-ray unit, digital sensors, safety precautions, film identification, film placement using both bisecting and paralleling techniques, and film processing and mounting are all studied. Students are encouraged to take the Radiation, Health and Safety (RHS) examination administered from the Dental Assisting National Board (DANB). Students also review and expand upon materials previously studied. Students receive instruction in the areas of application of dental materials, restorative procedures, prosthodontic procedures, laboratory procedures, and Dentrix software procedures. OHSA/Career Safe Healthcare is received. Students are taught the skills necessary for externship and Co-Op employment.

7324: Grade 11 Related
The Dental Assisting related theory instruction is intended to complement the vocational instruction and laboratory projects taught during the junior year in the Dental Assisting program. Radiation health and safety, identification of dental materials and dental disease on radiographs, disease prevention, direct patient care, oral hygiene instruction, fixed prosthodontics, and provisional coverage.

8424: Grade 12 Shop
During this year considerable instruction in Dental Specialties, pharmacology, and a review of all subjects previously taught is studied. Qualified seniors participating in the cooperative education program gain industry experience in paid positions off-campus. To participate in the co-op education program, students must meet all co-op requirements and be in good academic and vocational standing. Those students not on co-op will participate in a mandatory co-op externship affiliation. This externship will allow (the) student to receive the 200 clinical hours needed for registration by the State of MA.

7424: Grade 12 Related
The Dental Assisting related theory instruction is intended to complement the vocational instruction and laboratory projects taught during the senior year in the Dental Assisting program. Students review and expand upon materials previously studied. Program topics include Anatomy and Physiology of the Human Body and Head and Neck Anatomy, Strands 4 and 5 Management and Entrepreneurship Knowledge and Skills & Employability, and Career Readiness will be implemented throughout the curricula. Some of the standards include; Career Exploration and Navigation, Work Ethic and Professionalism, Legal/Ethical/Social Responsibilities, define entrepreneurship and be able to recognize and describe the characteristics of an entrepreneur. ***Licensing/Certifications:*** Healthcare Pathways OSHA-Authorized CareerSafe ® Online, The American Heart Association Heartsaver®, First Aid and Basic Life Support CPR Certifications, Certified Dental Assistant (CDA) Dental Assisting National Board (DANB), Radiation Health and Safety (RHS) Exam, Infection Control (ICE) Exam, *General Chairside (GC) Exam: Studentscan apply CO-OP experience hours towards 3500 hours**, must be paid employment working under a licensed dentist,* Students can obtain 200 clinical hours necessary to register for the Stateof Massachusetts Initial Dental Assistant Licensure – Registered Dental Assistant (RDA). Prior to sitting for the Chairside (DANB) Examination 3,500 paid working hours must be obtained to acquire CDA Certification. Some additional fees may apply, including certification exams, state licensing exams, and industry-recognized credentials.

Design & Visual Communications

Grade 9 Exploratory
This exploratory course is designed to have all perspective candidates participate and be evaluated on their abilities in the Design and Visual Communications industry. Interested students accomplish this task by completing a broad range of challenging introductory level projects that cover both traditional and digital illustration skills, computer aptitude skills, and creative writing skills. Interested candidates are given an in-depth presentation and tour of upper-class labs and provided a DVC information package that contains pertinent information that students are encouraged to take home review with parents and guardians.

Grade 9 Shop
Students will experience a diversified foundation level course that includes academic and trade disciplines of Typography, Color Theory, Graphic Design, Illustration and Digital Photography and creative writing. Students will take knowledge gained and begin to apply theoretical and academic principles to the development of the portfolio through studio and academic projects. These skills will be used to enhance

and assist students in the foundation level portfolio development.

8221: Grade 10 Shop
A broad-based foundation curricula of trade related disciplines of both traditional arts and digital arts will be the emphasis throughout this grade level. Students build foundation skills in the creative process, including principles and elements of design, concept development, color theory, drawing, illustration, and painting. Additionally, students practice digital photo editing and manipulation, digital illustration, graphic design, typography, animation, film, and digital photography. These skills will be used to enhance and assist students in their development of an integrated foundation level portfolio.

7221: Grade 10 Related
This course will combine the corresponding curricula from the academic disciplines of Typography, Color Theory, Graphic Design, Illustration, Creative Writing, and Art History with the knowledge gained from the grade 9 foundation level Design and Visual Communications and continue to apply theoretical and academic principles to the development of the portfolio through related academic projects. These skills will be used to enhance and assist students in their development of an integrated foundation level portfolio.

8321: Grade 11 Shop
A comprehensive level course continuing skills gained from grade 10. Students apply knowledge in both traditional arts and digital arts. Knowledge and skills gained are in the following areas: The creative process, principles/elements of design, concept development, color theory, drawing/ illustration, painting, digital photography/illustration, graphic design/typography and animation. Students will develop more independence and competency in these areas. Students apply trade principles to the development of portfolios through rigorous studio projects. Students are also provided with the opportunity to apply for Adobe Certifications.

7321: Grade 11 Related
A comprehensive integrated level course continuing the academic disciplines of Typography, Color Theory, Graphic Design, Illustration, Creative Writing, and Art History. Students will take knowledge gained from grade 10 intermediate Design and Visual Communications and continue to apply theoretical and academic principles to the development of the portfolio through related academic projects. These skills will be used to enhance and assist students in their development of an intermediate level portfolio.

8421: Grade 12 Shop
Competencies gained from junior year are utilized in this advanced level course where students will continue to demonstrate proficiency in both traditional and digital arts, applying those competencies as they relate to Management & Entrepreneurship of the Design & Visual Communications frameworks. Competency and proficiency gained are displayed in the following areas: The principles & elements of design, concept development, color theory, drawing/illustration, painting, digital photography/video, digital illustration, graphic design, web design, animation, creative writing, and art history. Students are also encouraged to work independently to complete portfolios for co-op & application to a post-secondary institution. Students are required to use skills gained and start a trade related freelance business. College dual enrollment opportunities are also available to senior students who are interested.

7421: Grade 12 Related
A comprehensive advanced level course applying the theoretical and academic principles of Management & Entrepreneurship, principles & elements of design, concept development, color theory, drawing, illustration, painting, digital photography/video, digital illustration, graphic design, web design, animation, and art history. Students will take knowledge gained from grade 11 advanced Design and Visual Communications and apply theoretical and academic principles to the final development of related academic projects. These skills will be used to enhance and assist students in their development of an advanced level portfolio. Strands 4 and 5 Management and Entrepreneurship Knowledge and Skills & Employability and Career Readiness will be implemented throughout the curricula. Some of the standards include; Career Exploration and Navigation, Work Ethic and Professionalism, Legal/Ethical/Social Responsibilities, define entrepreneurship and be able to recognize and describe the characteristics of an entrepreneur.

***Licensing/Certifications*:** General Industry OSHA-Authorized CareerSafe ® Online Adobe Certified Professional in Visual Communications. Some additional fees may apply, including certification exams, state licensing exams, and industry-recognized credentials.

Drafting

Grade 9 Exploratory
The 9th grade Drafting program is divided into two separate efforts: Exploratory Drafting, which is an introductory 30 hours of a mix of shop and related studies, and then Technical Drafting for the remainder of the 9th grade school year shop weeks. This course is designed to introduce the student to the world of computer-aided drafting & design (CAD) and to the career opportunities that are available to a student graduating from this program. The fundamentals of drafting are taught using a wide variety of multimedia and hands-on experience. Utilizing the latest release of AutoCAD2 and SolidWorks software this course will cover navigating the CAD work environment, drawing setup, drawing, and modifying objects and text, managing object propertiesand introduction to 3-D solid modeling. Students learn geometric construction skills to plan and create drawings of a mechanical and architectural nature and the design process and model- making are introduced through a variety of projects.

8211: Grade 10 Shop
Sophomore students work on CAD workstations utilizing the latest release of AutoCAD2D, Pro/Engineer's Creo and SolidWorks solid modeling software and output devices to produce and interpret layouts using CAD command and measurement skills for determining geometric shapes, orthographic projections, dimensional parts, section and auxiliary views, pictorials, 3-D wire frame, solid models, detail and assembly drawings. 3-D solid modeling and 3-D rapid prototyping. Shop assignments are created to emulate a real drafting company environment.
Assignments cover all aspects of the drafting trade including, hand sketching, measurement, accuracy, geometric construction, orthographic projection, dimensioning and tolerancing, detail and assembly drawing aspects, screw threads and fasteners, welding, manufacturing processes, and the design process. In addition, a significant portion of the curriculum covers all aspects of 3-D creation and generating working drawings form the 3-D designs. Projects with design and

build aspects shall be followed up with the machine and metal fabrication shop for possible build or rapid prototyping (3-D Printing) for proving concepts.

7211: Grade 10 Related
Drafting students in their sophomore year learn the principles of the American National Standards Institute (ANSI Y14.5) Drafting Standards, using basic math, accuracy of measurement, sketching and geometric construction. The theories of visualization of surfaces, orthographic projection, and dimensioning are also introduced. Students begin to create mechanical working drawings by learning the process of concepts and layout procedures for detail drawings and assembly drawings. Students are exposed to all possible drafting opportunities in each engineering field covering all aspects of the trade, including career opportunities, measurement, accuracy, sketching, geometric construction, orthographic projection, dimensioning and tolerancing, report writing, detail and assembly drawing aspects, screw threads and fasteners, welding, manufacturing processes, and the design process.

8311: Grade 11 Shop
The Computer Aided Drafting and Design program is designed to train students for post-secondary education as well as entry level employment. The professional architectural drafter's responsibility is to convert architects, engineers, and designer's sketches and ideas into formal drawings. The eleventh- grade program instructs students on how to prepare a formal set of Construction Drawings. Drawing types include: Floor Plans, Roof Plans, Elevations, Framing Sections, Stair Sections, Detail Drawings and Site Plans. Students learn and incorporate relevant Building Codes into their technical drawings. Students utilize hand sketching, modeling, and presentation drawings to document their projects. Team building and collaboration are incorporated consistently throughout the student's time in Shop. Once mastery of drafting skills has been achieved, students learn to implement their own design ideas to complete projects. Students learn in an industry simulated professional environment. Drafting computer programs utilized include AutoCad Architecture, Revit and Google SketchUp.

7311: Grade 11 Related
In their junior year Drafting students learn the theory behind Architectural Drafting. In addition to learning the concepts necessary to accurately create the Construction Drawings listed above, students learn house styles, design factors, framing methods, and the basics of supplemental drawings including MEP/FP disciplines. An emphasis is placed on mastering technical terminology for each learning unit and objective. Students are taught to increase awareness of their environment in order to develop a full understanding of the lesson objectives.

8411: Grade 12 Shop
Students, using state-of-the-art workstations equipped with the latest release of AutoCAD and SolidWorks, design a variety of electro/mechanical assemblies, and provide detailing of sheet metal enclosures, schematic diagrams, and printed/logic board layout including cabling and harnesses. The students may also be eligible for co-op employment in the drafting field, which provides invaluable experience in a professional drafting environment.

7411: Grade 12 Related
Seniors in this related course become more proficient in the process of sheet metal bending and development using allowances. The theory of coordinate hole tolerancing vs. geometric dimensioning and tolerance to identify the difference between minimum production and high quantity production (prototypes vs. production design) will be covered. Senior students will also be exposed to a deeper knowledge of the interchangeability of sheet metal components, which will be discussed along with cam development and gear technology. Electronic components, electrical characteristics, and schematic diagrams will be taught. Rules of design will be covered for component boards, printed circuit boards and logic boards. Instruction will also cover cable drawings, harness drawings for the preparation of shop electro/mechanical packaging project. Additionally, the senior drafting students will be exposed to engineering courses as well as financial literacy curriculum. These additional courses will enable and enhance the exposure of engineering and real-world problems that will include, statics, dynamics, and strength of materials, further preparing our seniors to be college and life ready. Strands 4 and 5 Managementand Entrepreneurship Knowledge and Skills & Employability and Career Readiness will be implemented throughout the curricula. Some of the standards include; Career Exploration and Navigation, Work Ethic and Professionalism, Legal/Ethical/Social Responsibilities, define entrepreneurship and be able to recognize and describe the characteristics of an entrepreneur.

Electricity

Grade 9 Exploratory
The Exploratory program within the Electrical shop acquaints students with the career opportunities within the electrical field. Students, through demonstrations and simple shop activities, learn basic wiring working with 120-volt circuits, which includes switches, lighting, and receptacles. Shop projects include basic splicing of conductors and working with N.M. cable wiring. Shop safety practices are stressed, and include instruction on proper use of handtools, as well as specialized shop equipment. Students also discover the many career opportunities available within the residential and commercial electrical field.

8212: Grade 10 Shop
Sophomore Electrical students are introduced to more complicated circuitry including switch loops and double pole switching. The basic wiring methods covered include: nonmetallic sheathed, metal clad cable (type MC); electrical metallic tubing (EMT); rigid metal conduit (RMC); surface metal raceway (SMR) and Rigid nonmetallic conduit. Safety precautions, proper tool use, and potential hazards continue to be stressed.

7212: Grade 10 Related
This course, governed and approved by the State Board of Electrical Examiners, integrates mathematics, science, blueprint reading, and the electrical code. Students achieve a basic understanding of electrical theory and code and particularly its application to electrical circuits, materials, and equipment that are utilized within the shop environment.

8312: Grade 11 Shop
Junior year projects include multi-wire branch circuit wiring, the expansion of existing circuitry, and wiring methods. Single phase – dual voltage projects that include the connection and energizing of service equipment are also performed by the students. Other projects include PVC conduits; panel wiring (main and sub panels); relay wiring and heating systems. MEWP (Scissor lift training) certification is completed while in the shop program. The centerpiece of the junior shop year is a unique opportunity to become involved with a school-sponsored house construction project. During years when offered, students are responsible for on-site new residential wiring.

7312: Grade 11 Related
The focus of the junior related program is residential circuit design and layout and dovetails withactivities and projects performed in shop. Initial instruction covers the layout of circuits for general lighting as well as portable and fixed appliances. OSHA 10-hour training and certification is completed during the first half of the school year. Later in the year, students are introduced to the design and sizing of electrical services and the circuit design and application ofresidential mechanical equipment. Like the 10th-grade course, this course integrated math, science, blueprints, and code theory on a more advanced level.

8412: Grade 12 Shop
Senior year students lay out and build sophisticated multi-functional motor control circuits. Each student learns trouble-shooting skills for both single and three-phase equipment and associated circuitry using a multi-meter. Student projects become more complex in design and implementation and include: transformers (single and three-phase); motor control; and industrial and commercial wiring procedures. Seniors engage in housework requests, or, if eligible, through the co-op program working in the field with electrical contractors during shop week.

7412: Grade 12 Related
The focus of this course is commercial/industrial wiring and covers the basic design and layout of electrical circuits and equipment installed in commercial and industrial buildings. The operating principles of motors, transformers, and their controlling circuits are also covered. Students also focus on advanced drawing preparation and interpretation of the Electrical Code for general and specific wiring methods. Strands 4 and 5 Management and Entrepreneurship Knowledge and Skills & Employability and Career Readiness will be implemented throughout the curricula. Some of the standards include; Career Exploration and Navigation, Work Ethic and professionalism, Legal/Ethical/Social Responsibilities, define entrepreneurship and be able to recognize and describe the characteristics of an entrepreneur.

***Licensing/Certifications*:** MEWP (Scissor lift training) training and certification, Construction OSHA 10-hour Outreach Training Card, NFPA's Hot Work Safety Certificate Program. Students can receive up to a maximum 300 (600) Related hours and 2000 (8000) Work Hours to sit for Massachusetts State License Class B (Journeyman) License Exam. Some additional fees may apply, including certification exams, state licensing exams, and industry-recognized credentials.

Electronics/Engineering Technology

The Electronics/Engineering Technology Program prepares students to enter the diverse and

lucrative industry of electronics/engineering as a technologist by applying scientific principles of electronic circuits and mechanical devices leading to practical consumer, computer, data/telecommunications, mechatronics, and automation/robotics systems outcomes using modern tools, instruments, equipment, materials, techniques, and processes.

Grade 9 Exploratory
A course to survey all aspects of this career field, acquire genuine understanding of this industry as well as a deeper appreciation of the modern everyday electronics devices we use and/or inspire further study. Students will be exposed to principles, components, circuitry, tools, equipment/instrumentation, and applications. Projects will include assembling, troubleshooting, and reworking basic electronics circuitry such as game, toy, and novelty circuits.

8213: Grade 10 Shop
The first in a series of three consecutive outcome-based courses in which students are exposed to all aspects of the electronics industry providing genuine theory and practice within this career field leading to employment or further study. Investigate basic concepts and applications of analog electronics to include power supplies, amplifiers, and oscillators. Fabricate test equipment from assembly documentation. Illustrate and simulate/emulate analog circuits using computer software. Fabricate printed circuit boards and printed circuit board assemblies. Perform "live work" on various non-functional, serviceable circuits and systems to return them to factory standard condition. Research, develop and chronicle technical documentation.

7213: Grade 10 Related
Sophomores in the Electronics/Engineering Technology program will be exposed to various theories of engineering principles. Understanding concepts of simple machines, mechanical advantage, forces, and other core engineering competencies will provide students a solid foundation to moveforward in the Electronics/Engineering Technology program. Emphasis will apply to Simple machines (pulleys, gears, inclined plane, lever, screw, wedge, wheel, and axle)**,** Mechanical advantage, Vector forces and statics, Intro to thermodynamics, Intro to pneumatic and hydraulic power, Intro to probability and statistics.

8313: Grade 11 Shop

The second in a series of three consecutive outcome-based courses in which students are exposed to all aspects of the electronics industry providing genuine theory and practice within this career field leading to employment or further study. Investigate basic concepts and applications of digital electronics to include logic gates, counter displays, memory registers, and data selectors. Fabricate test equipment from assembly documentation. Illustrate and simulate/emulate digital circuits using computer software. Fabricate printed circuit boards and printed circuit assemblies. Perform "live work" on various non-functional, serviceable circuits and systems to return them to industry standard condition. Activities will include; research development and chronicle technical documentation.

7313: Grade 11 Related
This course takes students to the next level with a comprehensive curricula of computer aided design and manufacturing principles and properties of materials. Competencies include;

Sketching skills, Orthographic and perspective views, Intro to Fusion 360, Geometry in design, Mechanical drafting introduction, Mechanical design introduction, Material properties, Manufacturing techniques, Intro to CAM / CNC.

8413: Grade 12 Shop
The third in a series of three consecutive outcome-based courses in which students are exposed to all aspects of the electronics industry providing genuine theory and practice within this career field leading to employment or further study. Use the engineering design process to investigate advanced concepts and applications of electronics to include physical computing, human-computer interface, mechatronics, consumerism/e-waste, additive/subtractive manufacturing, IoTand drones. Encounter the entire manufacturing cycle by prototyping advanced circuits and systems using microcontrollers and microprocessors. Seek and attain employment with various local companies and corporations.

7413: Grade 12 Related
Seniors in the Engineering Technology program will be tasked with identifying a problem that could be solved using the engineering design process, and working as a team to develop a testable, working prototype. Students will learn about several aspects of the engineering design process, including; brainstorming; project management; engineering design; documentation; and communication. Through this process, students will move to proficiency in their problem solving, organization, and group work skills levels with standards of; Engineering design process, brainstorming problem/solution techniques, Project management (Gantt charts, budgets, resources), Create product specifications, develop test plans and procedures, Build, evaluate, and iterate prototypes, and summarize and reflect on the project. Strands 4 and 5 Management and Entrepreneurship Knowledge and Skills & Employability and Career Readiness will be implemented throughout the curricula. Some of the standards include; Career Exploration and Navigation, Work Ethic and Professionalism, Legal/Ethical/Social Responsibilities, define entrepreneurship and be able to recognize and describe the characteristics of an entrepreneur.

***Licensing/Certification*:** General Industry OSHA 10-hour Outreach Training Card, IPC J-STD-001 Requirements for Soldered Electrical and Electronic Assemblies, ETA Electronics Technician Certification, MSSC Production Technician Certification. Some additional fees may apply, including certification exams, state licensing exams, and industry-recognized credentials.

Graphic Communications

Grade 9 Exploratory
The exploratory program provides freshmen with the many aspects and experiences of the graphic communications industry. Students will be introduced to the Adobe Creative Suite software, creating designs in Illustrator for the vinyl cutters and the screen-printing press. Producing their vinyl stickers and tee-shirts. Students will navigate through the InDesign program to set up memo pads and business cards using page layout skills and outputting them to the digital color copiers using various paper stocks. Through rotations in the different areas of the shop students learn basic skills in machine safety, design,

file set up, binding-finishing, papercutting, and screen printing.

8214: Grade 10 Shop
Sophomore students will rotate through the seven areas of the production area. Screen Printing, Embroidery, Large Format, Vinyl Signage, Copy Center, Sublimation and Binding-Finishing. Students will learn the operational set up, controls and safety of the machines. In the Mac Lab students create designs and file set up for shop projects and numerous live work for outside customers using the Adobe Creative Suite.

7214: Grade 10 Related
The sophomore related program provides students with history and overview of the Graphic Communications industry and career options. Focusing on the basics of design, pre-press, output,and workflow. Industry terms and vocabulary are introduced along with machine and chemical safety.

8314: Grade 11 Shop
Students continue their rotation in the production area perfecting their proficiency and developing both speed, skill, and safety. More advanced projects are presented in the prepress, press, and production area, offering students the opportunity to challenge themselves and their abilities in creativity and design. Customer Service offers students a unique opportunity to operate and manage a "print on demand" copy center, assisting school staff with their classroom and administrative copy needs. The spotlight of the junior shop year is portfolio preparation, taking the skills they have acquired in shop and creating a portfolio with materials they design, set-up and output using the various machines in the production area. Students will be required to complete their projects and continue with live work. Teaching them time management and skillsneeded in every profession. As students acquire these skills, they are preparing for potential co-op positions beginning at third term. Students will all begin working on their Adobe Certifications.

7314: Grade 11 Related
More advanced topics in the Graphics' field are covered, with an emphasis on presenting the theory behind their various projects. Emphasis on machine and chemical safety continues to be essential curricula in understanding components in industry. Students also complete their OSHA 10-Hour training and begin preparing for co-op integrating strands four, five and six of the frameworks. Students complete resumes and cover letters as well as participate in mock interviews and learning Employability, Management & Entrepreneurship, and Technological standards.

8414: Grade 12 Shop
As seniors, students proceed to the most advanced levels in each area of the shop as they perfect the prepress, press, binding, and customer service skills by completing a wide range of projects including the introduction of variable data. Seniors will finish any Adobe certification not completed in their junior year. Students who are eligible for the school's co-op program work in a variety of printing establishments and obtain valuable on-the-job training. The Customer Service area continues to give students the responsibility of communicating with customers,

estimating, prioritizing, and scheduling jobs, maintaining equipment, and managing the copy center. At the conclusion of the senior year all students will produce a completed portfolio that highlights their successful completion of a variety of projects. For students on co-op, they will include photographs of the work they produced while working in industry.

7414: Grade 12 Related
Senior related incorporates the knowledge that students have acquired in shop with advanced theory. Color is one special area emphasized in this course, including use, function, and chemistry. Students also complete their portfolios with an emphasis on the direction they are heading when they graduate. Students spend a great deal of time discussing career options to prepare them for their entrance into the world of work. Students complete an in-depth investigation on a chosen career. As part of this investigation students learn what the prerequisites they need for certain careers, i.e., degrees or certifications. Additionally, students look at growth and the job market outlook as well as salaries for the careers they choose. Activities will include a student presentation for parents that includes a career map for the next five years. Strands 4 and 5 Management and Entrepreneurship Knowledge and Skills & Employability and Career Readiness will be implemented throughout the curricula. Some of the standards include; Career Exploration and Navigation, Work Ethic and Professionalism, Legal/Ethical/Social Responsibilities, define entrepreneurship and be able to recognize and describe the characteristics of an entrepreneur.
Licensing/Certifications: General Industry OSHA 10-hour Outreach Training Card, Adobe Certifications, Adobe InDesign, Adobe Photoshop, Adobe Illustrator. Some additional fees may apply, including certification exams, state licensing exams, and industry-recognized credentials. Some additional fees may apply, including certification exams, state licensing exams, and industry-recognized credentials.

Health Assisting

Grade 9 Exploratory
The Health Exploratory Program introduces the student to the broad spectrum of health studies as well as the various career opportunities available within the health care industry. The student experiences hands-on activities and projects, including basic first aid, hand washing, bed making, health promotion and body systems.

8223: Grade 10 Shop
The student will participate in entry-level activities encompassing the necessary skills for future employment in various types of health care facilities. The ultimate objective is the development of interpersonal skills with patients, visitors, and the health care staff. Application of anatomy and physiology theory from the urinary, cardiovascular, and nervous systems will be performed in the laboratory setting. The student will perform basic health assisting procedures such as vital signs, range of motion, intake and output, basic pharmacological math and learn to assist in

caring for the patient with various diseases and disorders. Clinical skills are practiced in laboratory before the student begins affiliation. Certification in AHA Healthcare Provider CPR and First Aid are obtained.

7223: Grade 10 Related
This course is designed to provide the student with the basic knowledge of the structure and function of the human body. The concepts of anatomy and physiology are discussed utilizing a systems approach beginning at the cellular level. The student will begin to recognize variations from the normal and how these influence the functioning of the whole organism. This course is covered in a series of detailed lectures supported by hands-on-activities and human anatomical models.

8323: Grade 11 Shop
This course introduces the student to the role of Certified Nurse Assistant. The clinical procedures and techniques covered include phlebotomy, microbiology, specimen collection, capillary blood glucose testing, infection control, physical assessment, EKGs, vital signs, and isolation techniques. Emphasis is placed on performance of tasks in an accurate and timely manner, recording data, and specimen handling according to OSHA guidelines. Students complete the MA Department of Public Health Nurse Assistant program.

7323: Grade 11 Related
This course is designed to provide the student with an introduction to the theory associated with disease pathology as it pertains to nurse assisting, the nurse assistant's role in caring for patients with altered health patterns, and disease prevention through education. This course includes medical terminology which will provide the student with the essential knowledge needed to communicate accurately and effectively with medical professionals using specialized language utilized within the health care industry. This course identifies legal and ethical considerations as they relate to patient care and the practice of health assisting.

8423: Grade 12 Shop
The twelfth-grade shop curriculum introduces the student to the role of the nurse assistant in the acute care setting. Students learn advanced nurse assistant skills such as wound care, care of the patient with an indwelling catheter and ostomy, sterile technique, assisting with medication administration and means of providing alternate nutrition. A review of medical terminology is integrated throughout the curriculum. Students also pursue cooperative placements during shop time.

7423: Grade 12 Related
This course is designed to provide the student with an understanding of human development from birth through death with an emphasis on health promotion. The course will increase self-understanding and help the student to become aware of the deviations from the normal patterns of growth and development brought about by illness. The student is introduced to theorists and their frameworks and beings to apply the theories to varied age groups. The student becomes aware and accepting of the culturally diverse groups, understanding the norms and conflicts that dictate their everyday life. At each stage of life, illness, or injury the student adopts methods to

alter their nursing care of the patient. The student identifies community settings and resources available to meet the needs of those patients and their families. Within this course, effective communication skills are utilized enhancing the use of therapeutic communication with patients. Strands 4 and 5 Management and Entrepreneurship Knowledge and Skills & Employability and Career Readiness will be implemented throughout the curricula. Some of the standards include; Career Exploration and Navigation, Work Ethic and Professionalism, Legal/Ethical/Social Responsibilities, define entrepreneurship and be able to recognize and describe the characteristics of an entrepreneur.

Licensing/Certifications: Healthcare Pathways OSHA-Authorized CareerSafe ® Online, The American Heart Association Heartsaver®, First Aid and Basic Life Support CPR Certifications, The CARES® Dementia Basics™ Online Training Certificate. Some additional fees may apply, including certification exams, state licensing exams, and industry-recognized credentials.

Heating-Ventilation-Air Conditioning-Refrigeration

Grade 9 Exploratory

The exploratory program offers freshmen the opportunity to demonstrate their abilities in a series of hands-on projects designed to acquaint students with the HVAC&R industry. Students learn to wire series and parallel electric circuits and how to use a volt and ohmmeters. Sheet metal, copper soldering, brazing, and assorted connecting techniques are introduced. Safety issues and career opportunities are stressed.

8201: Grade 10 Shop

Sophomores spend substantial time learning to blend, flare, solder and braze copper tubing. They also work on various wiring projects, with strong concentration on basic electricity and basic controls wiring. From these projects, students gain skills in using pictorial and ladder schematicsas well as voltmeters, ohmmeters, and amprobe meters. Students also begin to design various refrigeration piping schemes and apply them to multiple refrigerant applications. Tasks such as installing manifold gauges, vacuum pumps, recovery units, and charging cylinders to refrigeration units are also covered. Students spend substantial time taking the basic skills they have learned and applying them to troubleshoot basic electrical and refrigeration problems using multi-meters and manifold gauges.

7201: Grade 10 Related

The initial focus of this course is the laws of thermodynamics, heat transfer methods, and refrigeration components (compressors, condensers, metering devices, evaporators). Refrigerant characteristics and safety issues are also discussed in detail. The application of standard refrigeration components (filter driers, receivers, solenoid valves, sight glasses, and pressure controls) is reviewed, as are compressor-starting components, applications, and trouble-shooting methods.

8301: Grade 11 Shop

Junior shop students move through a succession of increasingly complex projects to hone their skills. They begin with a gauge procedure in which they learn to properly install gauges, perform efficiency tests, isolate the compressor, pump down the system, and remove gauges. With these skills mastered, students concentrate on more advanced HVAC&R projects, including those dealing with split air conditioning systems, gas and oil heating systems, hot water boilers, freezer stations, and appliances including refrigerators, winder air conditioners, ice machines, and commercial air conditioner systems. In each case, these projects all serve to reinforce such basic skills as gauge procedure, electrical power, meter use, soldering, brazing and silver soldering.

7301: Grade 11 Related
Junior related students focus on electrical principles, components, meters, schematics, and systems applied to modern residential and commercial HVAC installations. Troubleshooting, servicing, and installing are covered in depth. Refrigeration principles standards and refrigerationcontainment are also emphasized in the curricula.

8401: Grade 12 Shop
Senior students increase their level of responsibility in shop by taking on projects in the school, including preventive maintenance of the building's HVAC&R equipment (rooftop units, water bubblers, walk-in freezers, and refrigerators). Students also become more skilled at sizing equipment, designing and laying out duct systems, and installing split air conditioning systems and ventilation systems in classrooms. Seniors also work on automobile air conditioning systems, mini split multi zone heat pumps, and a variety of other equipment brought in for repairby local businesses and the general public. Seniors who qualify for co-op have the opportunity to work in the trade during shop week.

7401: Grade 12 Related
Seniors review the basic refrigeration cycle, along with a concentration on commercial applications. They also gain knowledge of hydronic heating systems (single loop, split-loop diverter-tee, and pumping away methods) and the calculation of heat loss/gain methods. Additionally, they cover the design, installation, and troubleshooting of sheet metal ductwork. Strands 4 and 5 Management and Entrepreneurship Knowledge and Skills & Employability and Career Readiness will be implemented throughout the curricula. Some of the standards include; Career Exploration and Navigation, Work Ethic and Professionalism, Legal/Ethical/Social Responsibilities, define entrepreneurship and be able to recognize and describe the characteristics of an entrepreneur.
***Licensing/Certifications*:** Construction OSHA 10-hour Outreach Training Card, NFPA's Hot Work Safety Certificate Program. Environmental Protection Agency (EPA) 608 certification, EPA section 609 Mobile Air-Conditioning Certification, and R-410A Environmental Protection Agency Certification. 50 hours towards Massachusetts Journeyman Pipefitter, 150 towards Massachusetts Journey Sheet Metal Students can receive up to a maximum 1000 Work Hours to sit for Massachusetts State License (Journeyman) Refrigeration Technician License Exam. Some additional fees may apply, including certification exams, state licensing exams, and industry-recognized credentials.

Information Support Services & Networking/Programming & Web Development

Grade 9 Exploratory
Freshmen in the Information Support Services and Networking/Programming & Web Development program experience an overview of the major elements of the Information Technology field: web design, programming, and game development. Networking is a big part of our curriculum, and the students use specialized tools to build a network cable. A focus on cybersecurity as it relates to workstations and networks.

Topics include; password management, encryption, virus prevention, malicious software, phishing are also introduced through a variety of interactive programs. Working in teams, students learn to disassemble a personal computer, identify, and label each component, reinstall all components, and test it to assure full operation. Web sites are designed using JavaScript, edit 2 and 3d games and Unity3d. Students also get to explore essentials of Virtual Reality on mixed reality headsets. Shop safety and career opportunities complete the curricula.

8222: Grade 10 Shop
Sophomores in Internet rotate through two shop areas: Information Support Services and Programming & Web Development. Standards of the fundamental computer concepts are taught and reinforced through project-based activities with the objective of preparing students for troubleshooting and repair of computers. Network fundamentals with an emphasis on TCP/IP addressing and Small Office Home Office (SOHO) networks with safety procedures are also covered and expanded upon in the 11th grade. Programming & Web involves: A broad toolbox of professional grade, industry standard web development and programming skills are developed.
HTML. XML, CSS, JavaScript, Bootstrap, Node.js and jQuery are used and developed using Dreamweaver and Microsoft Visual Studio for web development and web site management. Students create and maintain a functional web site to serve as their professional grade digital portfolio. Sophomores also learn programming essential building blocks of programming by way of creating professional grade 2d, 3d and VR video games with the Unity 3d engine. Students learn and compare languages such as C#, Visual Basic, C++ and Python. Projects include; creating and manipulating files types like .obj using software such as ProBuilder and Polybrush.

7222: Grade 10 Related
Sophomore related class focuses on the theory and general principles component of the project-based activities performed during shop week. Among the topics and standards that are emphasized are programming and network theory, database development, IT terminology, identify preventive maintenance procedures using appropriate tools, and career development. Elements of software development and concepts, fundamental of security, operating systems, and computer hardware are all standards that are part of the curricula.

8322: Grade 11 Shop
The competencies covered in junior year prepare students for several career opportunities in PC

support, Network Implementation, administration, and support. Basic Network fundamentals are reviewed, and competencies associated with the CompTIA Network + certification are taught. Instruction includes the OSI model, network media, protocols, IP addressing, network standards, and network support. The students install Microsoft Windows Server 2019 in rack-mounted Dell and HP Servers. Competencies associated with Network Administration are the goals of these activities. Cybersecurity concepts, threats, protection, and administration of network environments are introduced through discussions and hands-on activities. Students get certified in TestOut PCPro and TestOut Security + curriculum. The students complete an online OSHA certification program and get certified when complete.

7322: Grade 11 Related
Programming & Web Students are introduced to Java programming. Students develop a more complex understanding of programming skills by working in teams for essential cross platform video game development. Games completed by students are included in their digital portfolio. Students can earn college credits via Becker College articulation agreement. Students are introduced to experience and develop in Virtual reality and Augmented reality.

8422: Grade 12 Shop
Seniors continue with project-based activities started in their junior year with the specific task of mastering the given standards. Networking and Security are covered with advanced concepts and activities. Linux is inserted into the mix, so students receive a good overview of desktop and server based operating systems, while configuring laptop hardware and components. Students who are not participating in the cooperative program are given the opportunity to repair in-house computers refining their troubleshooting skills and identifying various software testing techniques. Strand 4: Employability and Career Readiness are also a prime objective in preparing students; activities include students collaborating with clients to determine needs and wants while developing a competitive analysis to repair their computer or electronic devices.

7422: Grade 12 Related
Web Development Concepts – Programming Concepts, and concepts fundamental to server-side technologies - Compare and contrast current Operating Systems (OS) and their features. Throughout their senior year, students will continue to develop a professional digital portfolio, which includes a resume, recommendations, and examples of their work. This portfolio is designed to introduce them and their work to prospective employers and educational institutions. Additionally, job search and interview skills, resume preparation, and post-secondary education options are explored. Strands 4 and 5 Management and Entrepreneurship Knowledge and Skills & Employability and Career Readiness will be implemented throughout the curricula. Some of the standards include; Career Exploration and Navigation, Work Ethic and Professionalism, Legal/Ethical/Social Responsibilities, define entrepreneurship and be able to recognize and describe the characteristics of an entrepreneur.
Licensing/Certifications: General Industry OSHA-Authorized CareerSafe ® Online, TestOut PCPro and Security+, Microsoft Technical Associate (MTA) Security, Networking, Cloud, and Server. Some additional fees may apply, including certification exams, state licensing exams, and industry-recognized credentials.

Masonry & Tile Setting

Grade 9 Exploratory
Students in the Masonry exploratory program work on a series of hands-on projects that involve the use of basic hand tools, measuring devices and masonry materials. While practicing the techniques of paving, brick laying, and an introduction into tile setting, students develop an awareness of the skills necessary to succeed as a mason. Students are also introduced to the various career opportunities in the masonry field along with a history of the trade. They are exposed to the basic tools and materials utilized in the masonry field.

8217: Grade 10 Shop
Sophomore students participate in a series of basic projects utilizing brick, concrete, tile, and concrete block as well as some stone in shop. Students use modular planning for layout and students are shown basic tile layout and installation. Students are also required to complete safety training in the utilization of various tools and equipment used in the masonry field.

7217: Grade 10 Related
Sophomores in the related course receive instruction on the safe and appropriate use of masonry tools and materials. Students are shown basic brick and block bonding, types of joints, along with an introduction to blueprint reading and corresponding symbols.

8317: Grade 11 Shop
Junior students participate in a series of increasingly complex projects utilizing brick, concrete, and concrete block construction both in shop and on live building projects. Students use modular planning for layout and installation of windows, doors, and lintels, reinforcing and bonding.
Students are shown basic tile layout and installation.

7317: Grade 11 Related
Junior related emphasizes the principles and theory of the following: estimating brick and concrete block walls, masonry supports, chases, bearings walls, expansion, and control joints. Safe and efficient operation of various power equipment and safety practices are reinforced. OSHA 10-hour training course.

8417: Grade 12 Shop
Seniors further reinforce their masonry skills on varying projects in shop, around the school, and in the district on live construction projects. Focus is on brick, concrete, concrete block, tile, hardscape, and paving. Students also demonstrate skills in scaffolding construction and cold weather protection, wash down procedures, and masonry restoration. Those students eligible for the school's co-op program gain valuable skills working for local masons.

7417: Grade 12 Related
The related course for seniors emphasizes the principals and theory of the following: safety and types of scaffolding, fireplaces and chimneys, the development and construction of arches, concrete work, and blueprint reading. Strands 4 and 5 Management and Entrepreneurship

Knowledge and Skills & Employability and Career Readiness will be implemented throughout the curricula. Some of the standards include; Career Exploration and Navigation, Work Ethic and Professionalism, Legal/Ethical/Social Responsibilities, define entrepreneurship and be able to recognize and describe the characteristics of an entrepreneur.
Licensing/Certifications: Construction OSHA10-hour Outreach Training Card**,** NFPA's Hot Work Safety Certificate Program. Some additional fees may apply, including certification exams,state licensing exams, and industry-recognized credentials.

Medical Assisting

Grade 9 Exploratory
This course is designed to introduce the student to the entry level duties and knowledge of a Medical Assistant as well as provide an understanding of the career path for Medical Assisting. The student will be able to identify the instruments used by a medical office for patient assessment. The student will learn basic first aid techniques, basic nutritional concepts, digestion,infection control techniques, and spread of infection, as well as basics of blood typing for donors and recipients. The course is designed to facilitate a conceptual overview of the Medical Assisting field.

7215: Grade 10 Related
This course provides a basic knowledge of the structure and function of human body. Students are first introduced to an overview of the organization of the human body from the cellular level through organ systems. They continue with in depth discussion and lectures of each body system(The Human Body: An Orientation) and Basic Chemistry, Skin and Body Membranes, The Nervous System, Special Senses, The Endocrine System, Blood, The Cardiovascular System, The Lymphatic System and Body Defenses, The Respiratory System, The Urinary System, and the Reproductive System. Students also learn how these systems work together to achieve homeostasis, a balanced state.

8215: Grade 10 Shop
This course introduces the student to all the administrative and clerical procedures that are encountered in an outpatient medical facility and specialty offices. The student will learn how to make appointments, and maintain medical record, including electronic medical records. The student will be introduced to basic patient care skills such as obtaining vital signs and preparing patients for laboratory tests. The student will be competent in all CLIA waived diagnostic testing done in a doctor's office such as drug screen, hemoglobin, micro hematocrit, blood glucose analysis, cholesterol testing, urinalysis, and other specimen collection. In addition, the student will have instruction in medical terminology, human growth & development, and Anatomy and Physiology lab component.

8315: Grade 11 Shop
This course will focus on students furthering their skills of preparing patients for physical examination, and specialty exams. Students will learn proper patient positioning, as well as assisting in surgical procedures performed in a doctor's office, incorporating sterile technique while following all OSHA regulations. All students will be competent in the proper care of instruments, including sanitization and proper sterilization. Instruction will be given in

performing subcutaneous, intradermal, and intramuscular injections of medications. Students will also be taught phlebotomy, electrocardiography, basic principles of pharmacology, and wound care.

7315: Grade 11 Related
This course is designed to explore personal and occupational responsibilities of the practicing Medical Assistant. Emphasis is placed on interaction between the clinician and the patient, as well as disease pathology through each of the body systems. Topics include cardiac disease and disorders, respiratory diseases and disorders, endocrine diseases and disorders, reproductive system disease and disorders, as well as the other body systems. Upon completion, students will be able to understand and deal with the complexities of clinician/patient encounters, identify, and understand different body system disorders and diseases, prioritize patient care interventions based on identification of problem or disorder, and confidently understand and identify different medical procedure terms. Student will also be competent in clinical and administrative skills necessary for comprehensive patient care and strengthening professional communications and interactions. Upon completion, students should be able to function as an entry-level health care professional.

8415: Grade 12 Shop
This course will be a culminating demonstration of all aspects of the Medical Assisting skills. These skills will include direct patient care, clinical vital signs, patient records, appointment scheduling, billing, and coding, therapeutic communication, medical law and ethics, interpersonal skills, patient preparation, laboratory techniques, specimen collection, microbiology, nutrition, and various other clinical procedures as performed by the Medical Assistant. The student will also learn the entry-level skills for medical billing and coding, including basic ICD-9 and -10 and CPT codes.

7415: Grade 12 Related
This course is designed to introduce the student to the science of psychology as a journey of discovery. Students will be able to explain the history of psychology through the eyes of the early pioneers as well as explain some of the more contemporary concepts of psychology. Students will learn and understand the scientific methods used in psychology as well as read, understand, and critically analyze research articles. In addition, students will learn and understand the research domain, bio psychological domain, developmental domain, cognitive domain, and behavioral domain of psychology. This course will lend itself to the student in understanding the behavior of people and patients navigating their way through the health care system, regardless of what discipline or allied health career the student chooses in the future. Strands 4 and 5 Management and Entrepreneurship Knowledge and Skills & Employability and Career Readiness will be implemented throughout the curricula. Some of the standards include; Career Exploration and Navigation, Work Ethic and Professionalism, Legal/Ethical/Social Responsibilities, define entrepreneurship and be able to recognize and describe the characteristics of an entrepreneur.
Licensing/Certification: The American Heart Association Heartsaver®, First Aid and Basic Life Support Certifications, Student can obtain 160 (160) Clinical Hours towards (American Medical

Technologists) (AMT) Certification & Clinical Medical Assistant Medical Assistant (CCMA) Certification Exam, Eligibility for AMT (American Medical Technologists) National Certification Examination for Medical Assisting upon successful completion of the program and graduation. Some additional fees may apply, including certification exams, state licensing exams, and industry-recognized credentials.

Metal Fabrication & Joining Technologies

Grade 9 Exploratory
Students explore the two major components of the Metal Fabrication program, sheet metal and welding, by making a variety of simple projects in both areas using various hand tools and techniques. Safety is discussed and emphasized throughout the week which includes written and performance safety tests. Project-based activities will include using fundamentals of metal fabrication and joining and welding and joining processes and perform basic layout on flat materials.

8219: Grade 10 Shop
Safety is predominant and the operation of hand tools, equipment, and machinery is all reviewed. Basics Design Process and Material Layout are applied with projects with angles and scaling. The standards that the curricula focus on are the Welding and Joining Processes that include; oxy-acetylene welding, shielded metal arc welding (SMAW), gas metal arc welding (GMAW), the flux core welding, gas tungsten arc welding, soldering, and the spot-welding process.

7219: Grade 10 Related
The theory of welding and joining processes used in shop are integrated into the related curricula. Topics include; measurement techniques, blueprint reading, design process and material layout, and the welding applications of oxy-acetylene welding, shielded metal arc welding (SMAW), gas metal arc welding (GMAW), the flux core welding, gas tungsten arc welding, soldering, and the spot-welding process. Additionally, the standards of welding mathematics and pattern drafting, create basic mechanical drawings with dimensions to manufacture templates and duct components and convert drawings to DXF file will be integratedthroughout the curricula.

8319: Grade 11 Shop
Welding and joining processes practices and projects will continue to be a large part of the project-based activities. The Fundamentals of Sheet Metal Work is an essential part of the curricula that includes; students demonstrating safe techniques in using sheet metal tools / equipment for laying out, cutting, and fabrication fittings. Standards will include; basic pattern development techniques, including parallel, fabrication and Pattern Layouts, Welding and CNC Plasmsing Arc Cutting, and Soldering Metals. Tasks include; coping, notching, bending, and rolling in creating metal parts, boxes, and ducts. Math skills will be embedded within project-based activities. Welding projects consists of benches, chairs, tables, and back-rack.

7319: Grade 11 Related
The focus of the junior related course continues with welding and sheet metal theory that coordinates with the fabrication processes implemented shop. The functional, mechanical and safety aspects of electric arc and gas processes, basic and advanced joint design, material and alloy selection, and machine maintenance are covered, as well as overviews of such exotic welding techniques as explosion welding, friction welding, and sub-merged arc. Basic trigonometry and geometry techniques are introduced in relation to industry standards. Further advanced blueprint reading is also covered, including interpretation of basic lines, symbology, views and drawing types. Students become more skilled at sheet metal pattern drafting, covering layout technique up to parallel line development, radial line development, and triangulation. Students also go over construction drawings and architectural sketching, leading up to the design of their junior year project.

8419: Grade 12 Shop
The Welding and Joining Processes project-based activities engage students to obtain mastery oftheir skill levels. Projects consists of a variety of complex design items that include in-house and community enterprises. Reading and defining blueprints is emphasized on the various jobs assigned. Students will also engage in designing and installing air duct systems, architectural sheet metal consisting of layout techniques learned in the previous years. Students who do not qualify for co-op are placed on projects according to what skills need to be worked on. Other standards include preventive equipment maintenance, cutting and gouging processes, and mechanical cutting.

7419: Grade 12 Related
Advanced sheet metal math and blueprint reading are the major focuses of senior related class. Students also benefit from a review of shop subject matter and other issues within the trade, including welding metallurgy, metal properties, and metals with SAE identification, spark testing, and other methods of metals identification. Further discussion on heat treatment and hardening, annealing, and stress relieving are also introduced. Standards cover consists of coordinating air duct systems with structural and architectural considerations demonstrate proper measurement devices for specific applications while defining attributes, tolerances, bend allowances, units, and systems. Strands 4 and 5 Management and Entrepreneurship Knowledge and Skills & Employability and Career Readiness will be implemented throughout the curricula. Some of the standards include; Career Exploration and Navigation, Work Ethic and Professionalism, Legal/Ethical/Social Responsibilities, define entrepreneurship and be able to recognize and describe the characteristics of an entrepreneur.
***Licensing/Certifications*:** Construction OSHA10-hour Outreach Training Card**,** NFPA's Hot Work Safety Certificate Program. American Welding Society (AWS) Certifications, Massachusetts State Sheet Metal License - Students can receive up to a maximum of 1600 (8,000) hours of Sheet Metal experience, 150 (750) hours of Board-approved education to sit for a J-1 Unrestricted Journeyperson License Exam. Some additional fees may apply, including certification exams, state licensing exams, and industry-recognized credentials.

Plumbing

Grade 9 Exploratory
The objective of this course is to give an overview of the opportunities in the plumbing field and the knowledge and skills required to pursue a career in plumbing. Students engage in project-based activities that apply fundamentals required to install and join copper tubing, cast iron soil pipe, and thread steel pipe. Shop safety, basic trade math, measurement skills, and licensing and career opportunities in the plumbing trade are also included in the curricula.

8220: Grade 10 Shop
At this level, students demonstrate the safe use, storage, and maintenance of shop tools and equipment. A plethora of project-based projects that encompass techniques in measuring, cutting,and joining steel, copper, cast-iron, plastic, Cross Linked Polyethylene (PEX) pipe & fittings. These projects will include joining techniques and procedures in fabricating water distribution,sanitary drainage, ventilation, and gas projects. Students gain more proficiency in all types of power and hand tools as well.

7220: Grade 10 Related
Textbooks, codebooks, demonstrations, lectures, and written examinations are some of the instructional strategies and resources that students will be provided. Standards will include: reading technical drawings and blueprints, as well as plumbing social principles and standards where students will describe the fundamentals of the plumbing industry and the historical development of the plumbing industry. Students will identify career opportunities available in theplumbing industry and describe the types of regulatory codes & licensure in the industry. Identify different fittings, pipes, hangers, and their different application are discussed. Embeddedmathematics and science are also integrated throughout the curricula.

8320: Grade 11 Shop
The curricula junior year emphasizes the installation and service of plumbing components. Project-based activities include the layout and fabrication on bathrooms and kitchens applications. Standards include; Venting & Drain Systems, bathroom fixture group consisting of a water closet, lavatory, and fixtures. Installation and repairs on kitchen and lavatory faucets, commercial and residential dishwashers, and garbage disposers. Students will identify the major components of a public and private water supply system. The repair and maintenance of appliances and equipment, as well as the practical application of plumbing theory is covered. Additionally, junior students also participate in outside building projects, such as a house project or light commercial work within the district (depending on availability).

7320: Grade 11 Related
The junior year related course informs students about advanced plumbing code theory through the Plumbing codebook, demonstrations, lectures, and written examinations. Curricula also covers formulas, licenses, water heaters, cleanouts, trapping sanitary drainage, venting, and water distribution. Other standards include; the operation and assembly of flushometers,

ballcocks, and water closet discharge systems and types, assembly, and repair of shower valves, and the reasons for installing anti-scald shower valves, and techniques in selecting and installing plumbing fixtures.

8420: Grade 12 Shop
Project-based activities engage students to obtain proficiency in their skills level working with all types of pipes, fittings, fixtures, faucets, hot water heaters, tank-less heaters, and gas appliances. Troubleshooting & Servicing equipment throughout the school grounds is also provided to enhance live work gaining valuable on-the-job experience. If students qualify to participate in the cooperative program, they will have the opportunity to become a pre-apprentice and work in the field for a Master Plumber.

7420: Grade 12 Related
The objective of this course is to advance and finalize student proficiency in the Plumbing codebook. Lessons focus on; sizing venting systems according to the Massachusetts State Plumbing Code and identifying pipe and fitting materials allowed on venting systems described by Water Supplies & State Code. Designing and sizing potable water systems and methods of protecting the potable water system as described in the Massachusetts State Plumbing Code. Other codes include; identifying the means of producing hot water and the protection of these systems and identify the major components of a public and private water supply system and describe the function of each component. Strands 4 and 5 Management and Entrepreneurship Knowledge and Skills & Employability and Career Readiness will be implemented throughout the curricula. Some of the standards include; Career Exploration and Navigation, Work Ethicand Professionalism, Legal/Ethical/Social Responsibilities, define entrepreneurship and be able to recognize and describe the characteristics of an entrepreneur.
Licensing/Certifications: Construction OSHA10-hour Outreach Training Card**,** NFPA's Hot Work Safety Certificate Program. American Welding Society (AWS) Certifications, ViegaPEX™ ProPress Pipe & Fittings Certification, TracPipe Flexible Gas Corrugated Stainless Steel Tubing (CSST) Certification., FlowGuard Gold® Chlorinated Polyvinyl Chloride (CPVC) Certification, Students can receive up to a maximum of 330 (550) related theory hours and 1700 (8,500) work hours for Massachusetts State Plumbing (Journeyman) License. Some additional fees may apply, including certification exams, state licensing exams, and industry-recognized credentials.