

Shawsheen Valley Vocational Technical
High School
Program of Studies



Academic and Technical Course Offerings
2020-2021

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General Information

Mission

At Shawsheen Valley Technical High School, 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.

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.** SVRVTSD 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 12 shop programs. At the end of the final exploratory cycle, 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.

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 begins, 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 requested has been reviewed by the teacher and the guidance counselor and approved by the administration.

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 (currently for seniors only) is as follows:

Course	Eligibility Requirements
1ENG101 English Composition 1 (3 credits)	<ul style="list-style-type: none">▪ 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
2GOV120 American Government (3 credits)	
3MAT177 Statistics (3 credits)	<ul style="list-style-type: none">▪ PSAT or SAT score of 480 or higher for Evidence Based Reading and Writing▪ 85% or higher in 11th grade English course▪ 85% or higher in Algebra II▪ At least a 3.0 high school grade point average
5CHE121 Intro to Chemistry (4 credits)	

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 upper-classmen. 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.

Vocational Technical Programs
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
Machine Tool Technology
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 21 st Century Civic Literacy (Semester course)	1	1.25
4011	CP Digital Literacy I (Semester course)	1	1.25
PHYSICAL EDUCATION/HEALTH			
6100-6101	Physical Education and Wellness Students take one semester of Freshman Fitness/Aquatics and one semester of Freshman Health	1	2.0
SUPPORT SERVICES			
9010	Educational & Organizational Strategies I*	5	2.5
CVTE PROGRAM & RELATED THEORY			
	Freshman College Preparatory (CP) Health and Safety, (Terms 1-3)	1	3.0
	College Preparatory Career Awareness, (Terms 1-3)	1	12.0
	Freshman College Preparatory Related Technology (Term 4)	1	2.0
	Technology Shop/Lab (Term 4)	1	3.0
TOTAL REQUIRED CREDITS			42
<i>* Enrollment in this course requires an IEP, TEAM recommendation, and parental consent.</i>			

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
5024	CP Lab Biodiversity**	3	5.0
9522	Biodiversity & Ecology*	5	2.5
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/HEALTH			
6200- 6201	Sophomore Physical Education and Wellness Students take one semester of Sophomore Fitness/Aquatics and one semester of Sophomore Health	1	1.0
SUPPORT SERVICES			
9020	Educational & Organizational Strategies II*	5	2.5
CVTE PROGRAM & RELATED THEORY			
	Sophomore College Preparatory Related Technology	1	2.5
	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.			

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
4331	MCAS Mathematics**		5	2.5
SCIENCE				
5030	Honors Physics		1	5.0
5031	Honors Lab Chemistry		1	5.0
5032	CP Lab Chemistry		2	5.0
5033	CP Lab Anatomy & Physiology		2	5.0
5034	CP Lab Physical Science		2	2.5
5035	CP Lab Horticulture		2	2.5
SOCIAL STUDIES				
2030	Honors Modern World History		1	2.5
2031	CP Modern World History		2	2.5
2032	CP U.S. History II (required for students who could not take USII in 10 th grade)		2	2.5
2033	CP Untold History (Semester course)		2	1.25
4030	CP Financial Literacy (Semester course)		2	1.25
9232	Modern World History*		5	2.5
FOREIGN LANGUAGE				
4031	CP Spanish I (Semester course)		1	1.25
4032	CP Spanish II (Semester course)		1	1.25
4033	CP Spanish I (Summer course)		1	1.25
4034	CP Spanish II (Summer course)		1	1.25
4035	CP Spanish I (After-school course)		1	1.25
4036	CP Spanish II (After-school course)		1	1.25
PHYSICAL EDUCATION/HEALTH				
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
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	Honors English Composition 1, Concurrent Enrollment	CE	5.0
1041	Honors Senior English	1	5.0
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 (Honors)	CE	5.0
3040	Honors Calculus	1	5.0
3041	CP Pre-Calculus	2	5.0
3042	CP Statistics	2	5.0
3043	CP Introduction to Statistics and Trigonometry	2	5.0
3044	CP Introduction to Trigonometry	2	2.5
9342	Senior Mathematics*	5	5.0
4341	MCAS Mathematics**	5	2.5
SCIENCE			
5CHE121	Intro to Chemistry, Concurrent Enrollment	CE	5.0
5041	Honors Lab Physics	1	5.0
5042	CP Lab Physics	2	5.0
5043	CP Lab Anatomy & Physiology	2	5.0
5044	CP Lab Chemistry	2	5.0
5045	CP Lab Physical Science	2	2.5
5046	CP Horticulture	2	2.5
SOCIAL STUDIES			
2GOV120	American Government, Concurrent Enrollment	CE	2.5
2040	Honors U.S. Government and Politics	1	2.5
2041	CP U.S. Government and Politics	2	2.5
2042	CP America at War	2	2.5
2044	CP The Untold History (Semester course)	2	1.25
4040	CP Financial Literacy (Semester course)	2	1.25
9242	U.S. Government and Politics*	5	2.5
FOREIGN LANGUAGE			
4041	CP Spanish I (Semester Course)	1	1.25
4042	CP Spanish II (Semester Course)	1	1.25
4043	CP Spanish I (Summer course)	1	1.25
4044	CP Spanish II (Summer course)	1	1.25
4045	CP Spanish I (After-school course)	1	1.25
4046	CP Spanish II (After-school course)	1	1.25
PHYSICAL EDUCATION/HEALTH			
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	Outdoor & Indoor Team Games	3	2.5
SUPPORT SERVICES			
9040	Postsecondary Transition Planning II*	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 (see Support Services sections for more details). Placement into each of the levels is determined by standardized comprehension scores, writing scores, and by teacher recommendation. Please see the descriptions on page 13 for a more detailed explanation of the placement criteria for each level. A Concurrent Enrollment English course is offered during senior year. Eligibility for this course is outlined on page 5.

GRADE 9 ENGLISH

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

Aligned with the *Massachusetts English Language Arts and Literacy Frameworks*, this course strengthens students' basic reading and writing skills. Students will apply their knowledge of selected literary elements to interpret works of fiction and non-fiction. Students apply the rules of writing mechanics (spelling, capitalization, and punctuation) as well as syntax (grammar, usage, and sentence structure) to written expression. The writing process will be modeled and taught. Enrollment in this course requires an IEP, TEAM recommendation, and parental consent.

GRADE 10 ENGLISH

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 development of argument/persuasion, exposition, analysis, and narrative writing skills with text-based evidence/support expected from multiple sources.

9124: Sophomore English

Aligned with the *Massachusetts English Language Arts and Literacy Frameworks*, this course strengthens students' knowledge and skills in literature, composition, and media in preparation for the Spring ELA MCAS test. Students are guided through the respective phases of the writing process while they review the mechanics and syntax presented in the ninth grade. Writing instruction culminates in products that include open response and essays of varying length. Enrollment in this course requires an IEP, TEAM recommendation, and parental consent.

GRADE 11 ENGLISH

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

Aligned with the *Massachusetts English Language Arts and Literacy Frameworks*, this course continues to strengthen students' knowledge and skills in literature, composition, and media. Students will read and interpret literature with greater independence. Students will apply knowledge of sentence, paragraph and compositional development with increasing maturity as they produce extended exposition in response to read text. 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 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 revision, students will produce written essays with arguable thesis statements and appropriate use of standard English. Students will produce a total of 18-24 pages of formal polished writing in three or more source-based essays. Students 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 a 3.0 high school grade point average.

1041-1045 Honors & 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

Aligned with the *Massachusetts English Language Arts and Literacy Frameworks*, this course continues to strengthen students' knowledge and skills in literature, composition, and media. Students will read and interpret literature with greater independence. In addition, students will apply receptive and expressive language skills in preparation for work-related tasks. 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 comprehension score is three or more years above grade level and (b) whose SWT or portfolio submissions have received a minimum holistic rating of seven on a 10-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 a 77 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 comprehension is approximately two years above grade level and (b) whose SWT or other writing portfolio submissions have received a minimum holistic rating of six on a 10-point scale.

Level 3: College Preparatory

CP Level-3 courses are designed for students (a) whose standardized comprehension score is at or near grade level and (b) whose SWT or other writing portfolio submissions have received a minimum holistic rating of five on a 10-point scale.

Level 4: College Preparatory

CP Level-4 courses are designed for students whose standardized comprehension score is below grade level but not within the remedial range. 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 standardized comprehension is between 3-4.9 years below grade level. The most general goal at this level is the effective treatment of diagnosed reading and writing deficits by practitioners certified as Reading Specialists or Consulting Teachers of Reading in Massachusetts.

<h2>Mathematics Course Descriptions</h2>
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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 a level 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 covers 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.

9312: Algebra I

The course is designed to strengthen the students' understanding of basic mathematics skills and concepts. Aligned with the *Massachusetts Mathematics Frameworks*, this 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 and breadth are differentiated to accommodate the pace of instruction and the needs of the students. 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 fulfilled either of the prerequisites detailed below:

1. Completed Honors Geometry and have been recommended by the Honors Geometry teacher.
2. Performed at an exemplary level in Algebra I, Level 1 and have been recommended by the Algebra I teacher as well as completed the assigned Geometry summer coursework required to move into the Honors program.

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 this course 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 be stressed. 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 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.

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.

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.

9322: Geometry

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 volume of solids. Students will measure various figures and investigate and predict critical relationships- especially congruence and similarity. In addition, the course will develop response strategies for MCAS test items- with an emphasis on open-response formats. Content and breadth are differentiated to accommodate the pace of instruction and the needs of the students. Enrollment in this course requires an IEP, TEAM recommendation, and parental consent.

GRADE 11

3030: Honors Pre-Calculus

This course is offered to juniors who have completed Honors Algebra II and have been recommended by the Honors Algebra II teacher. 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 grade 10 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 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, Level 3

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 will be 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

Aligned with the *Massachusetts Mathematics Frameworks*, this course covers a wide range of topics. After a review of the fundamentals of functions and equations from Algebra I, Algebra II students will continue to explore patterns, relations, and functions that involve the use of graphs and tables to interpret higher ordered equations, inequalities, and matrices. Content and breadth are differentiated to accommodate the pace of instruction and the needs of the students. Enrollment in this course requires an IEP, TEAM recommendation, and parental consent.

4331: MCAS Mathematics

This course is required for senior students who have not yet passed the Mathematics MCAS Test. Students will learn test-taking strategies along with problem solving and reasoning skills associated with the five strands of mathematical content contained in the *Massachusetts Mathematics Frameworks*—specifically, Number Sense and Operations; Patterns, Relations, and Algebra; Geometry; Measurement; and Data Analysis, Statistics, and Probability. 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

3MAT177 Statistics

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.

3040: Honors Calculus

This course is offered to seniors who have completed Honors Pre-Calculus and have been recommended by the Honors Pre-Calculus teacher. Aligned with the *Massachusetts Mathematics Frameworks*, this course stresses the study of calculus as the study of change. Particular attention will be given to the process of differentiation and integration of various types of functions as they model real world applications to business investment, economics, and physical sciences. This course targets students whose post-secondary plans include an undergraduate concentration in Engineering, Science, Mathematics, Computer Science, or Business.

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.

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: College Preparatory Introduction to 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 includes a review of core Algebra II concepts that will be required to be successful in Trigonometry. Students will engage 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. The breadth of material is differentiated to accommodate pace of instruction.

9342: Senior Mathematics

Aligned with the *Massachusetts Mathematics Frameworks*, this course focuses on algebraic equations including quadratic equations; measures of central tendency; measurement; slope and equation of a line; probability, percent, and proportions; geometric relations and theorems; transformations; and real life applications. MCAS testing performance will be addressed on an individual basis. Enrollment in this course requires an IEP, TEAM recommendation, and parental consent.

4341: MCAS Mathematics

This course is required for senior students who have not yet passed the Mathematics MCAS Test. Students will learn test-taking strategies along with problem solving and reasoning skills associated with the five strands of mathematical content contained in the *Massachusetts Mathematics Frameworks*—specifically, Number Sense and Operations; Patterns, Relations, and Algebra; Geometry; Measurement; and Data Analysis, Statistics, and Probability. Computer assisted tutorials will be incorporated into group instruction in an effort to target individual needs. Enrollment in this course requires an administrative recommendation.

Science Course Descriptions

GRADE 9

5011: Honors Lab Cell Biology

This course is offered to freshmen who earned a final grade of a B+ or higher in 8th grade Mathematics and Science courses and who have demonstrated readiness for this course measured by their performance on the ninth-grade ELA and Mathematics 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 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 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 the ninth-grade ELA and Mathematics 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

Aligned with the *Massachusetts Science and Technology Engineering Frameworks*, this course focuses on the chemistry of life, cell biology, genetics, and anatomy and physiology— modified to accommodate students' needs. The course will also reinforce test-taking strategies in preparation of MCAS testing. 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 a B or higher in Honors Cell Biology, a B+ or higher in Level 1 Algebra I or Honors Geometry, and are placed in ELA Level 1 or 2. 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 ELA courses. 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.

5024: College Preparatory Lab Biodiversity

This course requires an administrative recommendation and is offered to sophomores based on their performance in their 9th grade Cell Biology and ELA courses. 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. Students will be expected to respond and collaborate on projects and labs designed to provide further evidence of standard attainment.

9522: Biodiversity and Ecology

Aligned with the *Massachusetts Science, Technology, and Engineering Frameworks*, this course focuses on evolution, biodiversity, and ecology— modified to accommodate students' needs. The course will also reinforce test-taking strategies in preparation of MCAS testing. Enrollment in this course requires an IEP, TEAM recommendation, and parental consent.

GRADE 11

5030: Honors Lab Physics

This course is offered to juniors who earned a final grade of a C+ or higher in Honors Algebra II. Aligned with the *Massachusetts Science and Technology Engineering Frameworks*, this course is offered to highly motivated students who intend to further their education in science, mathematics or engineering. This Honors offering integrates principles of physics with laboratory experimentation and problem-solving applications. Units of study include graphical analysis of motion, forces, vectors, momentum, work, power, simple machines, energy, circular motion, center of gravity, heat and sound. 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.

5031: Honors Lab Chemistry

This course is offered to juniors who earned a final grade of a B or higher in Honors Algebra II and are enrolled in ELA Level 1 or 2. 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, and the atomic structure of atoms compared to the periodic table and chemical bonding. A significant portion of the course involves application of chemical nomenclature, formulas, equations, and product analysis.

5032: College Preparatory Lab Chemistry

This course is offered to juniors who are currently enrolled in Algebra II. *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 application of chemical nomenclature, formulas, equations, and product analysis.

5033: College Preparatory Anatomy & Physiology

This course will concentrate on the anatomy, physiology, and histology of the human systems which will include histology, the skeletal system, the muscular system and the digestive system. Students are expected to read the book independently. Skills that will be developed in this course include outlining, note taking, making better observations, relating structure with function, improved techniques of dissection and microscopy.

5034: College Preparatory Lab Physical Science

Aligned with the *Massachusetts Science and Technology Engineering Frameworks*, this course integrates principles of physics and chemistry with laboratory experimentation and problem-solving applications. Units of study include matter identification and classification as well as phase changes; understanding how to read and use the Periodic Table of Elements; how to understand and demonstrate chemical reactions; graphical analysis of motion and forces; and differentiating the forms of energy.

5035: College Preparatory Lab Horticulture

This is a laboratory inquiry-based course with a focus on problem-solving applications. Students will obtain skills that are necessary to plant, grow, and tend a garden. In addition, students will gain the skills to maintain and care for a well-established rain garden. Students will understand the reason for maintaining a rain garden and its benefits to the environment.

GRADE 12

5CHE121: Intro to Chemistry

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 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.

5041: Honors Lab Physics

Aligned with the *Massachusetts Science and Technology Engineering Frameworks*, this course is offered to highly motivated students who intend to further their education in science, mathematics or engineering. A final average of C+ or better in Algebra II or Honors Pre-calculus is a prerequisite. This Honors offering integrates principles of physics with laboratory experimentation and problem-solving applications. Units of study include graphical analysis of motion, forces, vectors, momentum, work, power, simple machines, energy, circular motion, center of gravity, heat and sound. 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.

5042: College Preparatory Lab Physics

Aligned with the *Massachusetts Science and Technology Frameworks*, this course is offered to students who intend to further their education in science, mathematics or engineering. A final average of C+ or better in CP Algebra II is a prerequisite. Trigonometric skills are de-emphasized at this level. This College-preparatory offering integrates principles of physics with laboratory experimentation and problem solving.

5043: College Preparatory Anatomy & Physiology

This course will concentrate on the anatomy, physiology, and histology of the human systems which will include histology, the skeletal system, the muscular system and the digestive system. Students are expected to read the book independently. Skills that will be developed in this course include outlining, note taking, making better observations, relating structure with function, improved techniques of dissection and microscopy.

5044: College Preparatory Lab Chemistry

Aligned with the *Massachusetts Science and Technology Frameworks*, this course targets twelfth grade students who are preparing for admission to four-year colleges and universities. Students

must have taken CP Algebra II to be eligible for this course. During this study of the properties of elements, compounds and mixtures, the atomic structure of atoms is compared to the periodic table and chemical bonding. A significant portion of the course involves application of chemical nomenclature, formulas, equations, and product analysis.

5045: College Preparatory Lab Physical Science

Aligned with Massachusetts Science and Technology frameworks, this course targets twelfth-grade students who are preparing for admission to four-year colleges and universities. This college-preparatory offering integrates principles of physics and chemistry with laboratory experimentation and problem-solving applications. Units of study include matter identification and classification as well as phase changes; understanding how to read and use the Periodic Table of Elements; understand and demonstrate chemical reactions; graphical analysis of motion and forces; differentiate the forms of energy.

5046: College Preparatory Lab Horticulture

This is a laboratory inquiry-based course with a focus on problem-solving applications. Students will obtain skills that are necessary to plant, grow, and tend a garden. In addition, students will gain the skills to maintain and care for a well-established rain garden. Students will understand the reason for maintaining a rain garden and its benefits to the environment.

<h2 style="text-align: center;">Social Studies Course Descriptions</h2>
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GRADE 9

2010: Honors United States History I

This course is offered to freshmen who have demonstrated readiness for this course measured by their performance on the ninth-grade Entrance Placement Exams Aligned with the *Massachusetts History and Social Science Frameworks*, this course will examine the significance of major periods of our nation's history. Students will investigate the causes and consequences of the American Revolution; the basic framework of democracy; and the concepts and beliefs that shaped our government. Units of study will focus on America's westward expansion, the foundation of political parties, and the economic and social changes that led to the growth of sectional conflict during the Civil War period. Further aligned with the Massachusetts Frameworks, course activity emphasizes discussion and written rhetorical response (e.g. cause-effect, comparison-contrast.)

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 will investigate the causes and consequences of the American Revolution; the basic framework of democracy; and the concepts and beliefs that shaped our government. Units of study will focus on America's westward expansion, the foundation of political parties, and the economic and social changes that led to the growth of sectional conflict during the Civil War period. Further aligned with the

Massachusetts Frameworks, course activity emphasizes discussion and written rhetorical response (e.g. cause-effect, comparison-contrast.)

9211: United States History I

Aligned with the *Massachusetts History and Social Science Frameworks* and offered only to students on Individual Educational Plans through the Support-Services Department, this course will examine the significance of major periods of our nation's history. Students will investigate the causes and consequences of the American Revolution; the basic framework of democracy; and the concepts and beliefs that shaped our government. Units of study will focus on America's westward expansion, the foundation of political parties, and the economic and social changes that led to the growth of sectional conflict during the Civil War period. The breadth and depth of the content will be differentiated to accommodate learning issues specific to students' needs.

4010: College Preparatory 21st Century Civic Literacy (semester-long course)

21st Century Civic literacy will examine the roles and responsibilities of citizens to participate in the political process, and the relationship of the individual to the law and legal system. Students will be exposed to a variety of contemporary topics through the analysis of expository texts and primary source documents. Students will learn the art of academic discourse through structured class discussion, extended argumentative writing assignments, and class debates. Additionally, students will learn how to access technology in order to research given topics, and share findings.

4011: Digital Literacy (semester-long course)

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.

GRADE 10

2020: Honors United States History II

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. Aligned with the *Massachusetts History and Social Science Frameworks* content, this course will examine the significance of major periods of our nation's history. Students will investigate the consequences of the Civil War and will explore the struggles, concepts, and beliefs associated with the shaping of modern America. Units of study will focus on Reconstruction, urban and industrial expansion, World War I, the Roaring Twenties, the Great Depression, World War II, and the Cold War. Students will trace the social, political, and economic impact created by global depression and two world wars. The course will conclude with the study of major events and themes in the late twentieth century. Further aligned with the

Massachusetts Frameworks, course activity emphasizes discussion and written rhetorical response (e.g. cause-effect, comparison-contrast.).

2021: College Preparatory United States History II

Aligned with the *Massachusetts History and Social Science Frameworks* content, this course will examine the significance of major periods of our nation's history. Students will investigate the consequences of the Civil War and will explore the struggles, concepts, and beliefs associated with the shaping of modern America. Units of study will focus on Reconstruction, urban and industrial expansion, World War I, the Roaring Twenties, the Great Depression, World War II, and the Cold War. Students will trace the social, political, and economic impact created by global depression and two world wars. The course will conclude with the study of major events and themes in the late twentieth century. Further aligned with the Massachusetts Frameworks, course activity emphasizes discussion and written rhetorical response (e.g. cause-effect, comparison-contrast.)

9223: United States History II

Aligned with the *Massachusetts History and Social Science Frameworks* and offered only to students on Individual Educational Plans through the Support-Services Department, this course will examine the significance of major periods of our nation's history. Students will investigate the consequences of the Civil War and will explore the struggles, concepts, and beliefs associated with the shaping of modern America. Units of study will focus on Reconstruction, urban and industrial expansion, World War I, the Roaring Twenties, the Great Depression, World War II, and the Cold War. Students will trace the social, political, and economic impact created by global depression and two world wars. The course will conclude with the study of major events and themes in the late twentieth century. The breadth and depth of the content will be differentiated to accommodate learning issues specific to students' needs.

GRADE 11

2030: Honors Modern World History

This course is offered to juniors who demonstrated proficiency in Honors United States History II or who received a teacher recommendation from their grade 10 United States History I teacher. Aligned with the *Massachusetts History and Social Science Frameworks*, this course is designed to build student understanding of world geography, civilizations, and global issues. Students will study these topics by researching and exploring guiding questions such as, "How do ideas migrate across cultures?;" "What brings about change in societies?;" and "How has the past shaped the world today?;" Students will explore various global conflicts, geography, genocide, globalization, religions, politics, economics, and modern challenges associated with humanity as it links to the past. In studying these topics, students will apply grades 11-12 reading, writing, speaking, and listening skills, and learn vocabulary and concepts related to history and social science.

2031: College Preparatory Modern World History

Aligned with the *Massachusetts History and Social Science Frameworks*, this course is designed to build student understanding of world geography, civilizations, and global issues. Students will study these topics by researching and exploring guiding questions such as, “How do ideas migrate across cultures?;” “What brings about change in societies?;” and “How has the past shaped the world today?” Students will explore various global conflicts, geography, genocide, globalization, religions, politics, economics, and modern challenges associated with humanity as it links to the past. In studying these topics, students will apply grades 11-12 reading, writing, speaking, and listening skills, and learn vocabulary and concepts related to history and social science.

2032: College Preparatory United States History II

This course is offered to juniors who were not able to take United States History II in the tenth-grade. Aligned with the *Massachusetts History and Social Science Frameworks* content, this course will examine the significance of major periods of our nation’s history. Students will investigate the consequences of the Civil War and will explore the struggles, concepts, and beliefs associated with the shaping of modern America. Units of study will focus on Reconstruction, urban and industrial expansion, World War I, the Roaring Twenties, the Great Depression, World War II, and the Cold War. Students will trace the social, political, and economic impact created by global depression and two world wars. The course will conclude with the study of major events and themes in the late twentieth century. Further aligned with the Massachusetts Frameworks, course activity emphasizes discussion and written rhetorical response (e.g. cause-effect, comparison-contrast.)

2033: College Preparatory Untold History (semester-long course)

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.

4030: College Preparatory Financial Literacy (semester-long course)

This course is designed to challenge all students to use critical thinking in the analysis and development of financial solutions to the many challenges associated with Financial Literacy. Through direct instructions, discussions of current events, and a wide-range of assignments and projects, students will gain technical and managerial skills that will allow them to succeed in the financial world.

9232: Modern World History

Aligned with the *Massachusetts History and Social Science Frameworks* and offered only to students on Individual Educational Plans through the Support-Services Department, this course will build student understanding of world geography, civilizations, and global issues. Students will study these topics by researching and exploring guiding questions such as, “How do ideas migrate across cultures?;” “What brings about change in societies?;” and “How has the past

shaped the world today?” Students will explore various global conflicts, geography, genocide, globalization, religions, politics, economics, and modern challenges associated with humanity as it links to the past. In studying these topics, students will apply grades 9-10 or 11-12 reading, writing, speaking, and listening skills, and learn vocabulary and concepts related to history and social science. The breadth and depth of the content will be differentiated to accommodate learning issues specific to students’ needs.

GRADE 12

2GOV120: American Government

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 SAT verbal; a grade of 85% or better in Junior English, and at least a 3.0 high school grade point average.

2040: Honors U.S. Government and Politics

This course is offered to seniors who demonstrated proficiency in Honors United States History II or Honors Modern World History, or who received a teacher recommendation from their grade 10 or grade 11 social studies teacher. Aligned with the *Massachusetts History and Social Science Frameworks*, students in this course will revisit the Founding Documents of the United States and Massachusetts with an emphasis on understanding their relevance and impact on policies and politics in the present. Students will study these topics by exploring and researching guiding questions such as “What does it mean to be an informed citizen?” and “How involved should the United States government be in world affairs?” Topics involve political parties and the political spectrum, analysis of the U.S. Constitution, landmark Supreme Court cases, and current events. In studying these topics, students apply grades 11-12 reading, writing and speaking and listening skills, and learn vocabulary and concepts related to history and social science.

2041: College Preparatory U.S. Government and Politics

Aligned with the *Massachusetts History and Social Science Frameworks*, students in this course will revisit the Founding Documents of the United States and Massachusetts with an emphasis on understanding their relevance and impact on policies and politics in the present. Students will study these topics by exploring and researching guiding questions such as “What does it mean to be an informed citizen?” and “How involved should the United States government be in world affairs?” Topics involve political parties and the political spectrum, analysis of the U.S. Constitution, landmark Supreme Court cases, and current events. In studying these topics,

students apply grades 11-12 reading, writing and speaking and listening skills, and learn vocabulary and concepts related to history and social science.

2042: College Preparatory America at War

Aligned with the *Massachusetts History and Social Science Frameworks*, 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 apply grades 11-12 reading, writing and speaking and listening skills, and learn vocabulary and concepts related to history and social science.

2044: College Preparatory Untold History (semester-long course)

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.

4040: College Preparatory Financial Literacy (semester-long course)

This course is designed to challenge all students to use critical thinking in the analysis and development of financial solutions to the many challenges associated with Financial Literacy. Through direct instructions, discussions of current events, and a wide-range of assignments and projects, students will gain technical and managerial skills that will allow them to succeed in the financial world.

9242: U.S. Government and Politics

Aligned with the *Massachusetts History and Social Science Frameworks* and offered only to students on Individual Educational Plans through the Support-Services Department, students in this course will revisit the Founding Documents of the United States and Massachusetts with an emphasis on understanding their relevance and impact on policies and politics in the present. Students will study these topics by exploring and researching guiding questions such as “What does it mean to be an informed citizen?” and “How involved should the United States government be in world affairs?” Topics involve political parties and the political spectrum, analysis of the U.S. Constitution, landmark Supreme Court cases, and current events. In studying these topics, students will apply grades 9-10 or 11-12 reading, writing, speaking, and listening skills, and learn vocabulary and concepts related to history and social science. The breadth and depth of the content will be differentiated to accommodate learning issues specific to students’ needs.

Physical Education and Wellness Course Descriptions

GRADE 9

6100-6101: Physical Education and Wellness

Aligned with selected standards of the *Massachusetts Comprehensive Health/Physical Education Frameworks*, the ninth-grade program focuses on an understanding of fitness fundamentals. All ninth graders will receive direct classroom instruction and participate in physical activities (outdoors and in the pool, gymnasium, and Fitness Center) designed to develop the knowledge and a condition of flexibility, muscular endurance, muscular strength, body composition and cardiovascular endurance. Students will also explore their own skill-related fitness—including agility, balance, coordination, power and speed, and they assess their current physical activity and fitness levels.

GRADE 10

6200 - 6201: Physical Education and Wellness

Aligned with selected standards of the *Massachusetts Comprehensive Health/Physical Education Frameworks*, the tenth-grade program focuses on wellness with the continuation of fitness activities designed to improve individual health and wellness. Aquatics, field and gymnasium skills are further developed. Positive and negative personal consequences of specific wellness-related issues are discussed in an effort to develop healthy decision-making.

GRADE 11

6300 - 6301: Physical Education and Wellness

Aligned with selected standards of the *Massachusetts Comprehensive Health/Physical Education Frameworks*, the eleventh-grade program endeavors to develop personal satisfaction and enjoyment in physical activity. Students reflect on their past knowledge and experience and explore and develop their own role and responsibility for their personal health and well-being. To appeal to students' individual interests and preferences, the program offers a variety of team and individual activities—specifically strength building and weight training, football, tennis, golf, basketball, soccer, speedball, softball, and Frisbee. Classroom instruction continues in developmentally relevant areas of health and wellness.

GRADE 12

6400 - 6401: Senior Physical Education and Wellness

Aligned with selected standards of the *Massachusetts Comprehensive Health/Physical Education Frameworks*, the twelfth-grade program requires seniors to engage in a variety of outdoor activities and indoor activities in the gymnasium, and Fitness Center. Classroom instruction continues in developmentally relevant areas of health and wellness.

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 basic fundamentals of strength training, aerobic training, and overall fitness training and conditioning. 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: Indoor & Outdoor Team Games

This course is offered to seniors and is designed to continue to give students the opportunity to gain personal fitness skills and knowledge through an enriched Physical Education program. Students will be empowered to make choices, meet challenges and develop positive behaviors in fitness, wellness and movement activity for a lifetime. Emphasis is placed on pickle ball, football, tennis, Ultimate Frisbee, volleyball, basketball, badminton, soccer, softball etc.

<h2>Foreign Language Course Descriptions</h2>
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4031/4041: College Preparatory Spanish I (semester-long course)

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 (semester-long course)

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.

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.

4036/4046: 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 9**9010: Educational & Organizational Strategies I**

This course is only offered to freshman who have an IEP, TEAM recommendation, and parental consent. This course is designed to teach executive functioning or organizational and higher order thinking skills to assist with academic success and achievement. Organizational skills, or foundational skills, that are taught and focused on include: organizing materials, planning and prioritizing, managing time, increasing sustained attention, paying attention to and remembering details, boosting working memory, and initiating assignments and projects, as well as self-advocacy. In Educational & Organizational Strategies I, additional time is spent orienting the student to the alternating school schedule, shop expectations, and realistic and appropriate shop selections.

GRADE 10

9020: Educational & Organizational Strategies II

This course is only offered to sophomores who have an IEP, TEAM recommendation, and parental consent. This course builds on the ninth-grade course Educational & Organizational Strategies I and is designed to teach executive functioning or organizational and higher order thinking skills to assist with academic success and achievement. Organizational skills, or foundational skills, that are taught and focused on include: organizing materials, planning and prioritizing, managing time, increasing sustained attention, paying attention to and remembering details, boosting working memory, and initiating assignments and projects, as well as self-advocacy. In Educational & Organizational Strategies II, additional time is spent on career exploration specific to the student's chosen vocational / technical area, and understanding how the student's diagnosed disability impacts his/her learning needs.

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 before transitioning to the world of work and/or post-secondary education and training. This course focus on self-determination, the process of taking control and making decisions that affect one's life. Self-determination provides students with the skills and abilities to:

- Make choices
- Make decisions
- Problem solve
- Set and attain goals
- Self-advocate
- Independently perform

Weekly lessons encompass a variety of topics, including accessing the appropriate supports, educational opportunities, employment opportunities, options, and rights. Post high school living and community involvement options are also covered. Topics specific to Postsecondary Transition Planning I include: Transportation and Travel, Job Application Skills, Accessing the RMV, Focus on Finances, Community Resources, College Overview, and Social Media Usage and Impact.

GRADE 12

9040: Postsecondary Transition Planning II

This course is only offered to seniors who have an IEP, TEAM recommendation, and parental consent. This course builds on the eleventh-grade course Postsecondary Transition Planning I and is designed for students with diagnosed disabilities who need additional support and

instruction before transitioning to the world of work and/or post-secondary education and training. This course focus on self-determination, the process of taking control and making decisions that affect one's life. Self-determination provides students with the skills and abilities to:

- Make choices
- Make decisions
- Problem solve
- Set and attain goals
- Self-advocate
- Independently perform

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

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.

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 and brazing, 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 affiliated with 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 (through the 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 cooling systems.

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 in the 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 shifts to 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 a term 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, & PowerPoint. QuickBooks Certification, WISE Financial Literacy Certification, Google Skillshop: Google Advertising/Google Search Ads Certifications. Some additional fees may apply, including certification exams, state licensing exams, and industry-recognized credentials.

<h2>Carpentry</h2>

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 house-building 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.

<h2>Cosmetology</h2>

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. OSHA/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: Students can 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 State

of 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 illustration skills as well as computer aptitude skills. Freshmen are provided a DVC information package that contains pertinent information that students are encouraged to take home.

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. 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 intermediate level portfolio development.

8221: Grade 10 Shop

A broad-based foundation curricula of trade disciplines of both traditional fine arts and digital arts will be the emphasis throughout this grade level. Students build foundation skills in the creative process, 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, and Illustration 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 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 the opportunity to apply for Adobe Certification and College Board Advance Placement (AP) in AP Art and Design in Drawing or 2D Design.

7321: Grade 11 Related

A comprehensive integrated level course continuing the academic disciplines of Typography, Color Theory, Graphic Design, and Illustration. Students will take knowledge gained from grade 11 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 employed 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, and animation. Students are also encouraged to work independently to complete portfolios for co-op & application to a post-secondary institution. Dual enrollment opportunities are also available to senior students.

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 12 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 Associate in Visual Communications 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.

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 AutoCAD and SolidWorks software this course will cover navigating the CAD work environment, drawing setup, drawing and modifying objects and text, managing object properties and 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 AutoCAD, 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 from 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 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 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.

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 hand tools, 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 with activities 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 of residential 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 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 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 move forward in the 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 board 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, IoT and 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, paper cutting, 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 skills needed 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 schematics as 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 refrigeration containment 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 repair by 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 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 computer 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.

Machine Tool 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

Machine 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 the 10-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 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, 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.

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 integrated throughout 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 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 of their 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 Journeyman 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. Student will Identify career opportunities available in the plumbing industry and describe the types of regulatory codes & licensure in the industry. Identify different fittings, pipes, hangers, and their different application are discussed. Embedded mathematics 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 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, 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.