

Shawsheen Valley Vocational Technical
High School
Program of Studies



Academic and Technical Course Offerings
2017-2018

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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.

Promotion and Graduation

Every student is required to take a full complement of courses each year. Promotion between grades relies on the student's successful completion of required courses and his/her satisfying the minimum credit requirements for each year identified in the next section of this booklet. Graduation relies on the accumulation of a sufficient number of credits at the conclusion of four years of study. Any student who fails to satisfy graduation criteria and who therefore cannot receive a high school diploma will be prohibited from participating in Commencement Exercises until all graduation requirements have been satisfied.

For promotion to the senior year, a junior must have successfully completed thirty-five (35) credits, which must include two years of shop, three years of English, three years of mathematics, two years of social science (one of which must be U.S. History), and two years of science.

Every student at Shawsheen Valley Technical High School must successfully complete shop and related during the sophomore, junior and senior years.

Graduation requirements at Shawsheen Valley Technical High School include the successful completion of four years of English, three years of mathematics, three years of physical education, three years of social studies (two of which must be United States History), and two years of science. Besides these local requirements, students must demonstrate competency in the state-mandated MCAS testing described on page seven of this booklet.

Summer School

Students who do not satisfy the preceding promotional or graduation requirements must successfully complete failed courses in summer school in order to be promoted or graduated. Students are expected to make up these courses during the summer that immediately follows the school year in which they failed the required course(s).

Eligibility for summer credit recovery requires a minimum final average of forty-five (45) percent in the failed course(s). To recover credit for failed courses, students must successfully complete course work in an accredited program with a minimum grade of seventy (70) percent. Credit may be recovered for a maximum of two failed courses during the summer.

Report Cards

Report cards are issued four times during the school year. Each student is evaluated on his/her academic performance in each subject. Marking-period and final averages are reported numerically in the following manner.

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

MCAS Testing

Shawsheen Valley Technical High School will continue to participate in MCAS testing through the Spring of 2017. Therefore, all members of the Class of 2019 will take the Spring 2017 MCAS test as sophomores in the areas of English Language Arts (ELA), mathematics, and either biology or chemistry.

Students who do not earn a passing score on any MCAS test will have multiple opportunities to retest. Students who score within the *Needs Improvement* range on either ELA or mathematics test higher may receive competency determinations by the successful completion of an Educational Proficiency Plan. Depending on their attendance, testing history, classroom performance, and educational status, students who score below the *Needs Improvement* range may qualify for an Appeal or an Alternative Assessment portfolio to gain a competency determination. A variety of homeroom, after-school, weekend, and summer activities are scheduled to assist at-risk students with MCAS test preparation.

Rank in Class

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

College Preparatory Classes

Shawsheen Valley Technical High School prepares students for post-secondary education. Depending on the level (i.e. Honors, college-preparatory, remedial) of their study, students are prepared for admission to either two-year community-college programs or four-year baccalaureate programs. Community-college study may terminate with a certificate or a two-year Associate's Degree, or community-college credits may be transferred into a four-year program at state colleges and universities. Students who in-tend to apply for admission into four-year colleges and universities immediately following graduation should begin in their freshman year to prepare. Admission into four-year colleges and universities varies greatly, and it is highly competitive. Class rank, grade point average and performance on standardized tests such as the SAT/ACT are usually taken into consideration during the college admission process. Students are strongly encouraged to develop and maintain a close relationship with their guidance counselors as they select their academic courses. Students and parents can obtain a copy of the College and Career Planning Guide from the Shawsheen Guidance Office.

Honors Courses. Courses identified as Honors contain highly challenging material presented at an accelerated and more intensive pace than standard college preparatory courses. They require advanced conceptual, mathematical and study abilities and preparation beyond the classroom.

Massachusetts State Colleges and UMass Admissions Requirements

The admissions standards for Massachusetts state colleges and the UMass system emphasize a strong academic high school background. Students interested in applying to a state college or university should visit <http://www.mass.edu/shared/documents/admissions/admissionsstandards.pdf>, the Massachusetts Board of Higher Education web page.

Vocational-Technical Student Applicants

Vocational-technical students must complete seventeen (17) college preparatory courses, distributed in the same manner and with the same minimum grade point averages required of other high school graduates, with the following exceptions.

Two vocational-technical courses may be used to fulfill the two required electives

Vocational-technical high school graduates who do not complete the two required college-preparatory foreign language courses must complete an additional elective college-preparatory course, for a total of three such courses, and satisfy *one* of the following options:

- Complete at least one full academic year of study of foreign language or
- Complete a fourth full academic year of study of science technology/engineering, which need not be a laboratory course; or
- Complete one full academic year of study of computer science.

Learning Disabled Applicants

Applicants with professionally diagnosed and documented learning disabilities (documentation must include diagnostic test results) are exempt from taking standardized tests for admission to any public institution of higher education in the Commonwealth. Such students, however, must complete 17 required College-Preparatory academic courses with a minimum required GPA of 3.00 or present other evidence of the potential for academic success. An applicant may substitute two college preparatory electives for the two required foreign language courses only if the applicant has on file with the high school results of a psycho-educational evaluation completed within the past three years that provides a specific diagnosis of a learning disability and an inability to succeed in a foreign language. Eligibility for admission is not an entitlement of admission for any applicant, including learning disabled students.

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 conducted each spring be conducted with great care and with input from teachers and guidance counselors. Students will have an opportunity to meet individually with a guidance counselor to select courses for the next school year. Should extraordinary circumstances warrant a change in a student's schedule, the following criteria will be considered:

- Course changes will only be implemented at the end of the grading period.
- The course change requested has been reviewed by the teacher and the guidance counselor and approved by the administration.
- Changes will not be made without a properly completed course change sheet containing both parent and teacher approval.

Library and Media Services

The Shawsheen Valley Technical High School library was established to meet the vocational-technical and academic informational needs of students, teachers, and staff. To meet the school's commitment to enhance students' computer and research skills, a series of courses and workshops is offered to Shawsheen students to address these learning goals. Tenth grade students participate (during their related class) in a shop-based Research Skills Workshop, learning about and utilizing print, automated, and computer library research tools. Library staff regularly offers customized workshops and seminars to support both academic and vocational-technical programs and to reinforce research and information access skills.

Academic Programs
GRADE 9 CORE COURSES

ENGLISH LANGUAGE ARTS		
1011	Honors Freshman English, Level 1	5.0
1012	College Preparatory Freshman English, Level 2	5.0
1013	College Preparatory Freshman English, Level 3	5.0
1014	College Preparatory Freshman English, Level 4	5.0
1015	College Preparatory Freshman English, Level 5	5.0
9114	Freshman English*	5.0
MATHEMATICS		
3010	Honors Geometry	5.0
3012	College Preparatory Algebra I, Level 1	5.0
3015	College Preparatory Algebra I, Level 2	5.0
3016	College Preparatory Algebra I, Level 3	5.0
9312	Algebra I*	5.0
SCIENCE		
5010	Honors Lab Cell Biology	5.0
5011	College Preparatory Lab Cell Biology	5.0
5012	College Preparatory Lab Cell Biology	5.0
9511	Cell Biology*	5.0
SOCIAL STUDIES		
2010	Honors U.S. History I	5.0
2011	College Preparatory U.S. History I	5.0
9211	U.S. History I*	5.0
2111	21 st Century Civic Literacy	2.5
FOREIGN LANGUAGE		
4051	Spanish I	2.5
PHYSICAL EDUCATION/HEALTH		
6012-6015	Physical Education and Wellness	2.0
SUPPORT SERVICES		
9010	Study Skills*	5.0
CVTE RELATED THEORY		
	Freshman College Preparatory (CP) Health and Safety, (Terms 1-3)	3.0
	College Preparatory Career Awareness, (Terms 1-3)	12.0
	Freshman College Preparatory Related Technology (Term 4)	2.0
	Technology Shop/Lab (Term 4)	3.0
TOTAL REQUIRED CREDITS		44.0
*This course is only offered to students who are on IEP's. A TEAM recommendation is required.		
The 3-credit Related Technology courses are assigned in the following manner: College Preparatory Computer Science: Business Technology, Drafting, Electronics, Graphic Communications, Design and Visual Communication, and Information Support Services and Networking. College Preparatory Business Management: Auto Collision Repair and Refinishing; Automotive Technology; Carpentry; Cosmetology; Culinary Arts; Electricity; Heating, Ventilation, Air Conditioning, and Refrigeration; Masonry; Metal Fabrication; Machine Shop; and Plumbing. College Preparatory Nutrition: Health Assisting. College Preparatory Introduction to Anatomy and Physiology: Medical Assisting. College Preparatory Introduction to Dental Assisting: Dental Assisting		

GRADE 10 CORE COURSES

ENGLISH LANGUAGE ARTS		
1021	Honors Sophomore English, Level 1	5.0
1022	College Preparatory Sophomore English, Level 2	5.0
1023	College Preparatory Sophomore English, Level 3	5.0
1024	College Preparatory Sophomore English, Level 4	5.0
1025	College Preparatory Sophomore English, Level 5	5.0
9124	Sophomore English *	5.0
MATHEMATICS		
3020	Honors Algebra I	5.0
3022	College Preparatory Geometry, Level 1	5.0
3026	College Preparatory Geometry, Level 2	5.0
3027	College Preparatory Geometry, Level 3	5.0
9322	Geometry*	5.0
SCIENCE		
5025	Honors Lab Chemistry	5.0
5021	College Preparatory Lab Biodiversity and Ecology	5.0
5022	College Preparatory Lab Biodiversity and Ecology	5.0
5024	College Preparatory Biodiversity and Ecology with Study Skills (9020)*	2.5
9522	Biodiversity and Ecology with Study Skills (9020)*	2.5
SOCIAL STUDIES		
2010	Honors U.S. History I	5.0
2022	College Preparatory U.S. History I	5.0
9223	U.S. History I*	5.0
PHYSICAL EDUCATION/HEALTH		
6022-6025	Sophomore Physical Education and Wellness	2.0
SUPPORT SERVICES		
9020	Study Skills*	2.5
CVTE RELATED		
	Sophomore College Preparatory Related Technology	2.5
	Technology Shop/Lab	20.0
<i>Note. In the 20-credit Project Lead-the-Way (Drafting, Electronics, Machine Shop, and Metal Fab) Shop/Lab program, students earn 15 shop-specific credits and 5 credits for Digital Electronics (shop course #8520).</i>		
*This course is offered only to students on an IEP. A TEAM recommendation is required		
TOTAL REQUIRED CREDITS		44.5
<p>The five-credit Related Technology courses are assigned in the following manner: College Preparatory Computer Science: Business Technology, Drafting, Electronics, Graphic Communications, Design and Visual Communication, and Information Support Services and Networking. College Preparatory Business Management: Auto Collision Repair and Refinishing; Automotive Technology; Carpentry; Cosmetology; Culinary Arts; Electricity; Heating, Ventilation, Air Conditioning, and Refrigeration; Masonry; Metal Fabrication; Machine Shop; and Plumbing. College Preparatory Anatomy and Physiology: Health Assisting, Medical Assisting, and Dental Assisting. College Preparatory Infection Control: Dental Assisting</p>		

GRADE 11 CORE COURSES

ENGLISH LANGUAGE ARTS		
1031	Honors Junior English, Level 1	5.0
1032	College Preparatory Junior English, Level 2	5.0
1033	College Preparatory Junior English, Level 3	5.0
1034	College Preparatory Junior English, Level 4	5.0
1035	College Preparatory Junior English, Level 5	5.0
9134	Junior English*	5.0
MATHEMATICS		
3031	Honors Pre-Calculus	5.0
3032	College Preparatory Algebra II, Level 1	5.0
3036	College Preparatory Algebra II, Level 2	5.0
3037	College Preparatory Algebra II, Level 3	5.0
9332	Algebra II*	5.0
4331	MCAS Mathematics This course is required of Juniors who have not scored at or above the MCAS Needs Improvement range in Mathematics must enroll in MCAS Mathematics.	2.5
SOCIAL STUDIES		
2034	Honors U.S. History II	5.0
2035	College Preparatory U.S. History II	5.0
2036	College Preparatory U.S. History II**	2.5
9234	U.S. History II*	2.5
FOREIGN LANGUAGE		
	CP Spanish I***	2.5
	CP Spanish II***	2.5
PHYSICAL EDUCATION/HEALTH		
6032-3035	Junior Physical Education and Wellness	1.0
SUPPORT SERVICES		
9030	Study Skills*	2.5
CVTE RELATED		
	Junior College Preparatory Related Technology	5.0
	Technology Shop/Lab	20.0
TOTAL REQUIRED CREDITS		41
<p>*This course is only offered to students who are on IEP's. A TEAM recommendation is required. **This course is a college preparatory level course taken in conjunction with 9030 ***This course is offered on Tuesday and Thursday evenings to 11th and 12th grade students.</p> <p>The five-credit Related Technology courses are assigned in the following manner: College Preparatory Computer Science: Business Technology, Drafting, Electronics, Graphic Communications, Design and Visual Communication, and Information Support Services and Networking. College Preparatory Business Management: Auto Collision Repair and Refinishing; Automotive Technology; Carpentry; Cosmetology; Culinary Arts; Electricity; Heating, Ventilation, Air Conditioning, and Refrigeration; Masonry; Metal Fabrication; Machine Shop; and Plumbing. College Preparatory Disease Pathology: Health Assisting and Medical Assisting. College Preparatory Radiology: Dental Assisting College Preparatory Chemistry: Health Assisting</p>		

GRADE 12 CORE COURSES

ENGLISH LANGUAGE ARTS		
1041	Honors Senior English, Level 1	5.0
1042	College Preparatory Senior English, Level 2	5.0
1043	College Preparatory Senior English, Level 3	5.0
1044	College Preparatory Senior English, Level 4	5.0
1045	College Preparatory Senior English, Level 5	5.0
9144	Senior English*	5.0
MATHEMATICS		
3041	Honors Calculus	5.0
3042	College Preparatory Pre-Calculus	5.0
3046	College Preparatory Statistics	5.0
3047	College Preparatory Statistics and Trigonometry	5.0
3048	College Preparatory Statistics and Trigonometry	5.0
4341	MCAS Mathematics	2.5
9342	Senior Mathematics*	5.0
SCIENCE		
5141	Honors Lab Physics	5.0
5142	College Preparatory Lab Physics	5.0
5143	College Preparatory Lab Physical Science	5.0
5041	College Preparatory Chemistry	5.0
SOCIAL STUDIES		
2142	Civics	2.5
2342	Legal Issues	2.5
2042	College Preparatory Modern U.S. History	2.5
FOREIGN LANGUAGE		
4030	College Preparatory Spanish I	5.0
4032	College Preparatory Spanish II	5.0
PHYSICAL EDUCATION/HEALTH		
6410	Physical Education (Elective)	2.5
6041	Physical Education (Required)	.50
SUPPORT SERVICES		
9040	Study Skills*	5.0
CVTE RELATED		
	Senior College Preparatory Related Technology	5.0
	Technology Shop/Lab	20.0
TOTAL REQUIRED CREDITS		
	*This course is only offered to students who are on IEP's. A TEAM recommendation is required.	40.5
<p>The five-credit Related Technology courses are assigned in the following manner: College Preparatory Computer Science: Business Technology, Drafting*, Electronics*, Graphic Communications, Design and Visual Communication, and Information Support Services and Networking. College Preparatory Business Management: Auto Collision Repair and Refinishing; Automotive Technology; Carpentry; Cosmetology; Culinary Arts; Electricity; Heating, Ventilation, Air Conditioning, and Refrigeration; Masonry; Metal Fabrication*; Machine Shop*; and Plumbing. College Preparatory Human Growth and Development: Health Assisting. College Preparatory Psychology: Medical Assisting. College Preparatory Dental Specialties: Dental Assisting</p>		

English Language Arts Course Descriptions

Level 1: Honors

At the respective grade levels, Honors courses are designed for students (a) whose SDRT 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 by members of the Department. The prerequisite for placement in College Prep, 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. Students at this level are well prepared for post-secondary education and verbal proficiency in technical careers. Independent summer-reading projects are required components of all (grades 9-12) Honors courses.

Level 2: College Preparatory

At the respective grade levels, CP Level-2 courses are designed for students (a) whose SDRT 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 by members of the Department. Although the tasks at this level are less rigorous than those at level one, students are nonetheless well prepared for either post-secondary education or verbal proficiency in technical careers.

Level 3: College Preparatory

At the respective grade levels, CP Level-3 courses are designed for students (a) whose SDRT 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 by members of the Department. Although the tasks at this level are less rigorous than those at either level one or two, students are well prepared for technical-certificate or 2- or 4-year academic programs.

Level 4: College Preparatory

At the respective grade levels, CP Level-4 courses are designed for students whose SDRT 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 four is an appropriate starting level for college-prep students whose verbal skills need focused attention in the ninth grade.

Level 5: College Preparatory

At the respective grade levels, Level-5 courses are designed for students whose SDRT 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.

MATHEMATICS SEQUENCE OF COURSES

Grade 9	•Honors Geometry	• CP Algebra I, Level 1	• CP Algebra I, Level 2	• CP Algebra I, Level 3
Grade 10	•Honors Algebra II	• CP Geometry, Level 1	• CP Geometry, Level 2	• CP Geometry, Level 3
Grade 11	•Honors Pre-Calculus	• CP Algebra II, Level 1	• CP Algebra II, Level 2	• CP Algebra II, Level 3
Grade 12	•Honors Calculus •CP Statistics	• CP Pre-Calculus • CP Statistics	• CP Introduction to Statistics and Trigonometry	• CP Introduction to Trigonometry

All students are required to successfully complete three years of mathematics course work at Shawsheen Tech. Students who do not demonstrate competency on MCAS testing are required to complete a fourth year of mathematics course work. Students who plan to attend a four-year college or university are strongly encouraged to complete four years of mathematics instruction. Remedial courses based on an Individualized Educational Plan are described in the Support Services Program section

Mathematics Course Descriptions

GRADE 9

3010: Honors Geometry

This course is offered to freshmen who have demonstrated strong mathematics skills as measured by their performance on the eighth-grade Mathematics MCAS Test, the Stanford Diagnostic Mathematics Test, and an Honors Algebra Readiness Test. Geometry at the Honors level is a rigorous course that requires motivated students who have demonstrated dedication, self-direction, and mature algebra skills. The content of this course is aligned with the Massachusetts Mathematics *Frameworks* and 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 in Sophomore Honors Algebra II.

3012: College Preparatory Algebra I, Level 1

This course is offered to freshmen who have demonstrated a proficiency in basic mathematical concepts and a readiness to study CP Algebra I. This course provides a solid foundation in the algebraic skills that are necessary to pursue upper level mathematics. The content of this course is aligned with the Massachusetts Mathematics *Frameworks* and 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.

3015: College Preparatory Algebra I, Level 2

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. The content of this course is aligned with the Massachusetts Mathematics *Frameworks* and 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.

3016: College Preparatory Algebra I, Level 3

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. The content of this course is aligned with the Massachusetts Mathematics *Frameworks* and 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. Objective evaluation is required for placement in this Title-One funded course. Students who successfully complete Algebra I will be placed into CP Geometry in grade 10.

GRADE 10

3020: Honors Algebra II

This course is offered to sophomores who have who have completed Honors Geometry with a grade of C or better. Students at this level of mathematics must exhibit strong and consistent mathematical understanding and study skills. The content of this course is aligned with the Massachusetts Mathematics *Frameworks*. After an initial review of the fundamentals of functions and equations from Algebra I, sophomore Honors 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.

3022: College Preparatory Geometry, Level I

This course is offered to sophomores who have successfully completed CP Algebra 1, Level 1, in grade nine and whose placement has been recommended by the Algebra I teacher. The content of this course is aligned with the Massachusetts Mathematics *Frameworks* and 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 measure various figures and investigate and predict critical relationships—especially congruence and similarity. Students will be encouraged to develop spatial sense and to apply these principles to numerical applications. Students who successfully complete this course will be prepared to continue their study of Algebra II in grade eleven.

3026: College Preparatory Geometry, Level 2

This course is offered to sophomores who have successfully completed CP Algebra 1, Level 2, in grade nine and whose placement has been recommended by the Algebra I teacher. The content of this course is aligned with the Massachusetts Mathematics *Frameworks* and 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 measure various figures and investigate and predict critical relationships—especially congruence and similarity. The instructional method and pace anticipate and are differentiated to accommodate the learning profile of the level-2 mathematics population. Students who successfully complete this course will be prepared to continue their study of Algebra II in grade eleven.

3027: College Preparatory Geometry, Level 3

This course is offered to sophomores who have successfully completed CP Algebra 1, Level 3 in grade nine and whose placement has been recommended by the Algebra I teacher based on a program-mandated objective evaluation. The content of this course is aligned with the Massachusetts Mathematics *Frameworks* and 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 measure various figures and investigate and predict critical relationships—especially congruence and similarity. The instructional method and pace anticipate and are differentiated to accommodate the learning profile of the level-3 mathematics population. Students who successfully complete this course will be prepared to continue their study of Algebra II in grade eleven.

GRADE 11

3031: Honors Pre-Calculus

This course is offered to juniors (a) who achieved a final average of C or better in Honors Algebra II and in either Honors or CP Geometry or (b) who have received the recommendation of their tenth-grade Honors Algebra II teacher. The content of this course is aligned with the Massachusetts Mathematics *Frameworks* and covers a wide range of topics— combining the study of Trigonometry, Elementary Functions, Analytic Geometry, and Math Analysis topics as preparation for calculus. Topics include the study of 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; vectors; the polar coordinate system; conic sections; Boolean algebra and symbolic logic; mathematical induction; matrix algebra; sequences and series; and limits and continuity. Students who successfully complete this course and who receive the teacher’s recommendation may enroll in senior Honors Calculus or CP Statistics.

3032: College Preparatory Algebra II, Level 1

This course is offered to juniors (a) who achieved a final average of C or better in CP Algebra I, Level 1 or who have been recommended by their tenth-grade (Geometry) teachers in collaboration with their ninth-grade (Algebra I) teachers, and (b) who have completed CP Geometry. The content of this course is aligned with the Massachusetts Mathematics *Frameworks* and 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, inequalities, and matrices. Students will be expected to demonstrate understanding of the relevance of mathematical operations in problem solving, communications, and reasoning skills. Juniors who demonstrate strong performance in CP Algebra II, Level 1 and who receive recommendations from their mathematics teachers may continue their study of mathematics in senior CP Trigonometry and Analytical Geometry or CP Statistics.

3036 : College Preparatory Algebra II, Level 2

This course is offered to juniors (a) who achieved a final average of C or better in CP Algebra I, Level 2 or who have been recommended by their tenth-grade (CP Geometry) teachers in collaboration with their ninth-grade (CP Algebra I) teachers, and (b) who have completed CP Geometry. The content of this course is aligned with the Massachusetts Mathematics *Frameworks* and 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, 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. College-bound level-2 juniors should continue their study of mathematics by enrolling in CP Statistics and Trigonometry as seniors.

3037: College Preparatory Algebra II, Level 3

This course is offered to juniors (a) who achieved a final average of C or better in CP Algebra I or who have been recommended by their tenth-grade (Geometry) teachers in collaboration with their ninth-grade (Algebra I) teachers, and (b) who have completed CP Geometry. The content of this course is aligned with the Massachusetts Mathematics *Frameworks* and 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. College-bound level-3 juniors should continue their study of mathematics by enrolling in CP Introduction to Trigonometry as seniors.

GRADE 12

3041: Honors Calculus

This course, aligned with the Massachusetts Mathematics *Frameworks*, is offered to seniors who achieved a final grade of C or better in Honors Trigonometry and Mathematics Analysis or who have been recommended by their eleventh-grade mathematics teachers. 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.

3042: College Preparatory Pre-Calculus

This course is offered to seniors who achieved a final average of C or better in CP Algebra II or who have been recommended by their eleventh-grade mathematics teachers. The course content, aligned with the Massachusetts Mathematics *Frameworks*, combines the study of Trigonometry, Elementary Functions, Analytic Geometry, and Math Analysis topics as preparation for calculus. Topics include the study of 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; vectors; the polar coordinate system; conic sections; Boolean algebra and symbolic logic; mathematical induction; matrix algebra; sequences and series; and limits and continuity. Like Calculus, this course targets students whose post-secondary plans include an undergraduate concentration in Engineering, Science, Mathematics, Computer Science, or Business.

3046: College Preparatory Statistics

This course, aligned with the Massachusetts Mathematics *Frameworks*, is offered to seniors (a) who achieved a final average of C or better in Honors Algebra II, College Preparatory Algebra II, or Honors Trigonometry and Math Analysis, or (b) who have been recommended by their 11th grade mathematics teachers. The content of 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. This course targets students whose post-secondary plans include (a) the Liberal Arts, allied Health services/Nursing, Criminal Justice, or (b) any undergraduate program other than Engineering, Science, Mathematics, Computer Science, or Business.

3047: College Preparatory Statistics and Trigonometry

This course, aligned with the Massachusetts Mathematics *Framework*, is offered to seniors who completed CP Algebra II, Level 2 in the eleventh grade. 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.

3048: College Preparatory Introduction to Trigonometry

This course is offered to seniors who completed CP Algebra II, Level 2 or Level 3, as their eleventh-grade mathematics course. The content of this course is aligned with the Massachusetts Mathematics Frameworks. The course includes a brief review of key 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

4341: MCAS Mathematics

This course is required for seniors 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 Curriculum *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.

Science Course Descriptions

GRADE 9

5010: Honors Lab Cell Biology

Aligned with the Massachusetts Science and Technology *Frameworks*, this course—followed by Honors Sophomore Lab Chemistry—will broaden students’ understanding of the chemistry of life, cellular biology, genetics, and anatomy and physiology. Critical thinking skills will be developed through pre- and post-activity 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.

5011 and 5012: College-Preparatory Lab Cell Biology

Aligned with the Massachusetts Science and Technology *Frameworks*, this course—followed by sophomore Lab Biodiversity and Ecology—is intended to prepare students for the Biology MCAS examination at the end of grade 10. Students will broaden their understanding of the chemistry of life, cellular biology, genetics, and anatomy and physiology. Critical thinking skills will be developed through pre- and post-activity 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.

GRADE 10

5021 and 5022: College Preparatory Lab Biodiversity and Ecology

Aligned with the Massachusetts Science and Technology *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 ecology 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 work individually as well as collaboratively on projects designed to provide further evidence of standard attainment.

5024: Biodiversity and Ecology

Aligned with the Massachusetts Science and Technology *Frameworks*, this course is offered to students on an Individualized Education Plan (IEP.) The course content parallels that of the college-preparatory Biodiversity and Ecology course but is modified to accommodate students’ needs.

5025: Honors Lab Chemistry

Aligned with the Massachusetts Science and Technology *Frameworks*, Honors Chemistry is offered to sophomores who have demonstrated strong performance in ninth-grade Honors Algebra II. Students enrolled in this course will take the Chemistry MCAS test in the Spring of their sophomore year. All other students who do not satisfy the 5025 Algebra II requirement may elect College-Preparatory Chemistry in grade twelve.

GRADE 12

5141: Honors Lab Physics

Aligned with the Massachusetts Science and Technology 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 Honors Trigonometry and Math Analysis or a recommendation from the Honors Trigonometry teacher is prerequisite. Successful completion of Lab Chemistry is also recommended. 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, sound and light.

5041: College Preparatory Lab Chemistry

Aligned with the Massachusetts Science and Technology Frameworks, this course targets twelfth grade students who did not take Chemistry in grade ten and who are preparing for admission to four-year colleges and universities. CP Algebra II, Level 2 students must have a minimum GPA of 3.25. Junior level-4 English students must have a minimum final average of B+ in that 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. Successful completion of Algebra I and Algebra II is required.

5142: 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, Level 1 students must have a minimum GPA of 3.25. Junior level-4 English students must have a minimum final average of B+ in that course is required. Trigonometric skills are de-emphasized at this level. This College-preparatory 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, sound and light.

5143: College Preparatory Lab Physical Science

Aligned with Massachusetts Science and Technology frameworks, this course targets twelfth-grade students who did not take chemistry in the tenth grade and 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 graphical analysis of motion and forces as well as chemical nomenclature, formulas, equations and product analysis. Successful completion of CP Algebra 1 is a prerequisite.

Social Studies Course Descriptions

GRADE 9

2012: College Preparatory World History (Classes of 2018-2020)

Aligned with the Massachusetts History and Social Science *Frameworks*, this course provides an overview of how world history contributed to the development of the modern world. Course content will focus on Ancient Rome, the Byzantine Empire, the rise of Islam, the Middle Ages, the Renaissance and Enlightenment, European colonialism, the African slave trade, the rise of Communism and the Middle East. Emphasis in this course will be placed on understanding how world history contributed to the formation of the United States and our world today.

2010: Honors United States History I (Class of 2021)

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.) Students at the honors level must also be enrolled in Honors 9th Grade English.

2011: College Preparatory United States History I (Class of 2021)

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)

2111: 21st Century Civic Literacy

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.

GRADE 10

2021: Honors 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.)

2022: 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.)

GRADE 11

2034: Honors United States History II

Prerequisite for enrollment in this Honors U.S. History course is demonstrated proficiency in Honors United States History I. 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, the Cold War, the Civil Rights Movement, Vietnam, and other topics involved with the development of modern America. 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.)

2035: 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, the Cold War, the Civil Rights Movement, Vietnam, and other topics involved with the development of modern America. 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.)

2032: United States History II

Aligned with the Massachusetts History and Social Science *Frameworks*, this course is offered to students who are on an Individualized, and is taken in conjunction with course number 9030. Students will investigate the ideas and events comprising the 2035 curriculum—using the same text accompanied by ancillary support materials. The breadth and depth of the content as well as the instructional pace anticipate learning issues specific to special-needs populations.

GRADE 12

2042: Modern United States History

Aligned with the Massachusetts History and Social Science *Frameworks*, this course is offered to students who are on an Individualized Educational Plans (IEP). Classes meet five periods weekly in conjunction with five Study Skills meetings. Teachers from the Social Studies Department teach the History component, and teachers from the Support Services Department teach the Study Skills component. This course complements grades-11 United States History II (2032.) The breadth and depth of the content as well as the instructional pace anticipate learning issues specific to special-needs populations.

2142: Civics

Aligned with the Massachusetts History and Social Science *Frameworks*, this senior elective provides the foundational knowledge for understanding the purposes, principles, and practices of American government as established by the United States Constitution. Students will be expected to understand their rights and responsibilities as American citizens and how to exercise these rights and responsibilities in local, state, and national government.

2342: Legal Issues

Aligned with selected standards of the Massachusetts History and Social Science *Frameworks*, this senior elective is a study of the practical and theoretical aspects of law in American society. Students will investigate the various facets of our legal system such as criminal law, civil law, structure of courts, role of law enforcement, and the prison system.

Physical Education and Wellness Course Descriptions

GRADE 9

6011 (6012, 6013, 6014, 6015): 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

6021 (6022, 6023, 6024, 6025): 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

6031 (6032, 6033, 6034, 6035): 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

6401: Physical Education and Wellness

Aligned with selected standards of the Massachusetts Comprehensive Health/Physical Education *Frameworks*, the twelfth-grade Physical Education and Wellness elective program offers seniors the opportunity to select from 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.

6041: Senior Physical Education

Aligned with selected standards of the Massachusetts Comprehensive Health/Physical Education *Frameworks*, the twelfth-grade Physical Education and Wellness course requires seniors to engage in to a variety of outdoor activities and indoor activities in the gymnasium, and Fitness Center.

Support Services Course Descriptions

Please note that with each of the course outlined below, before it implements any of these services, the TEAM must determine that the student has a disability or disabilities that prevent him or her from progressing effectively in the general education program without specially designed instruction and a modified curriculum. The TEAM will consider previous placement, performance, and evaluative data.

GRADE 9

9114: Freshman English

Aligned with the Massachusetts English Language Arts *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.

9312: Algebra I

This course is offered to freshmen on IEPs. The course is designed to strengthen the students' understanding of basic mathematics skills and concepts. The content of this course is aligned with the Massachusetts Mathematics Frameworks and 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 is differentiated to accommodate the pace of instruction and the needs of the students.

9511: Cell Biology

Aligned with the Massachusetts Science, Technology, and 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.

9211: U.S. 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 ideas and events comprising the 2021 and 2022 curricula—using the same text accompanied by ancillary support materials. The breadth and depth of the content will be differentiated to accommodate learning issues specific to special-needs students.

GRADE 10

9124: Sophomore English

Aligned with the Massachusetts English Language Arts *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 long, formal essays.

9322: Geometry

This course is offered to sophomores on IEPs. The content of this course is aligned with the Massachusetts Mathematics Frameworks and 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 is differentiated to accommodate the pace of instruction and the needs of the students.

9223: 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 ideas and events comprising the 2021 and 2022 curricula—using the same text accompanied by ancillary support materials. Content and breadth is differentiated to accommodate the pace of instruction and the needs of the students.

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.

GRADE 11

9134: Junior English

Aligned with the Massachusetts English Language Arts *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.

9234: United States History II with Study Skills

Aligned with the Massachusetts History and Social Science *Frameworks*, this course is offered to students who are on an Individualized Educational Plans (IEP). The course topics include events and periods from colonization through the World Wars—modified to accommodate students’ needs.

9332: Algebra II

This course is offered to juniors on IEPs. The content of the course is aligned with the Massachusetts Mathematics Frameworks and 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 is differentiated to accommodate the pace of instruction and the needs of the students.

GRADE 12

9144: Senior English

Aligned with the Massachusetts English Language Arts *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.

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.

GRADES 9-12

9010, 9020, 9030, and 9040: Study Skills

Aligned with the Massachusetts *Frameworks* in the respective content areas, this course focuses on test taking strategies, executive functioning skills, reading and thinking skills, composition, and self-advocacy skills.

MCAS Remediation Course Descriptions

GRADES 9-12

Summer MCAS Help Sessions

The focus of this program is to strengthen mathematic skills, writing skills, and knowledge in biology. Curriculum targets mastery of the primary standards found on the MCAS mathematics, ELA and biology exams. An emphasis is placed on open response questions. The program runs 4 days a week for 3 weeks in July.

GRADE 10

English Language Arts Workshop

This focused mini-course is a preparation for the sophomore MCAS English Language Arts exam. Students will review a novel and organize and create a five-paragraph essay. Students will also review strategies for answering comprehension questions and for organizing an open response paragraph.

Mathematics Workshop

This focused mini-course is a preparation for the sophomore MCAS Mathematics test. Students will review skills needed to master primary standards found on the MCAS mathematics exam. Instruction emphasizes multiple-choice and open-response test-taking strategies.

Mathematics Tutoring

The mathematics tutoring program is delivered during study skills. The program targets the open response questions in the MCAS Mathematics test

Biology Workshop

This focused mini-course is a preparation for the sophomore MCAS Biology exam. Students will review all six standards addressed by the MCAS biology exam. Instruction emphasizes open-response test-taking strategies.

GRADES 11-12

Focused Tutorial Sessions

In preparation for the fall and spring retests, juniors and seniors who have not passed the MCAS Mathematics, ELA or Biology exams attend tutoring sessions. All sessions target individual needs and strengthen skills in mathematics, writing, and/or biology.

4331 and 4341: MCAS Mathematics

These courses are required for juniors (4331) and seniors (4351) 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 Curriculum *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.

9531: Concepts in Biology

This course is a requirement for any student who has not attained a passing score on the Biology MCAS test in preparation for grade-11 retesting. Content knowledge and application as well as test-taking (especially open-response) strategies are emphasized and addressed by technology-assisted and traditional instructional approaches.

Foreign Language Program and Course Descriptions

Beginning in the 2017-2018 school year Spanish I will be an elective option for 9th grade students as part of their academic course offerings. For 11th and 12th grade Spanish is offered to all eligible eleventh and twelfth graders. Spanish I classes are held two evenings weekly during the fall semester, and Spanish II classes are held two evenings weekly during the spring semester. Each class is two hours in length: students may enroll either a 3:30-5:30 PM or a 5:30-7:30 PM class.

4030: Spanish I

This course 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.

4031: Spanish II

This course is intended for those 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.

The Vocational Program

Ninth-Grade Exploratory

Rationale

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 vocational and technical areas, 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 and 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, particularly 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.

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.

Licensing/Certification:

The Automotive Collision Repair and Refinishing program is affiliated with the National Institute for Automotive Service Excellence, which offers two nationally recognized certifications: SP/2, a safety certification students earn through testing, and ASE certification, obtained after graduation, which certifies students in such areas as body repair, frame repair, and painting.

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 in 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. An overview of automotive systems is then presented, with special attention paid to engines, blocks, cylinder heads and valves, camshafts and valve trains, cooling systems, intake/exhaust, and cooling systems.

8303: Grade 11 Shop

Junior students work on 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 are required to experience the duties of a service writer.

7303: Grade 11 Related

Junior related students focus on 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.

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.

Licensing/Certification: General Industry OSHA 10-hour Outreach Training Card EPA-Authorized Section 609 Safety Certification the Automotive program is NATEF-certified. 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.

Business Technology and Marketing

Grade 9 Exploratory

The exploratory program in Business Technology introduces the world of business to freshmen. Included are an introduction to marketing, entrepreneurship, records management, keyboarding, accounting, ethics and web design, and Microsoft Office. Students, through a series of activities and hands-on projects, also learn ‘survival skills’--work traits and personal attributes necessary for successful employment in any environment--and an overview of career paths within the business field.

8204: Grade 10 Shop

Sophomores in the Business Technology shop gain knowledge of and experience in various business disciplines, including Accounting, Marketing, and Career Development. Great emphasis is placed on computer applications and Microsoft Office, particularly MS Word and PowerPoint.

7204: Grade 10 Related

The dual focal points of sophomore related class are business communications and word processing/ keyboarding skills. The goal of Business communications is to develop sound business writing and editing skills and focuses on punctuation, grammar, vocabulary, and proofreading. Students also develop and perfect their keyboarding skills as well as overall computer operations. Microsoft Word is a major focus of this course, as students receive a basic foundation in creating and formatting documents, using proofing tools, inserting graphics, and printing and transmitting documents.

8304: Grade 11 Shop

Juniors in shop continue to develop and expand their Microsoft Office skills in Word, Excel, PowerPoint, and Access. They also continue with Accounting studies. Among the projects and activities they undertake this year are the management, marketing and operation of the school store as well as a rotation in Business Lab, where students apply all learned business skills performing a wide range of tasks for school staff.

7304: Grade 11 Related

The related course for juniors encompasses the topics of business law and office skills. During the business law segment, students develop awareness of law in business and personal applications. Constitutional law is covered, as are applications of juvenile law, family law, and contractual/tort law. The office skills segment of related comprises both functional “hard skills” such as information processing, record keeping, math, and telephone procedures, and the equally crucial “soft skills” necessary for successful careers: teamwork, decision-making skills, problem-solving strategies, attitudes, and relationship skills. Career information and employment strategies are also covered.

8404: Grade 12 Shop

Senior Business students focus on Accounting/Management and Microsoft Office. In Accounting/Management, students sharpen their skills in Accounting and Marketing, complete a course on business-accounting software (QuickBooks) and use web design software to plan, produce and manage an office web site. Seniors are also responsible for all aspects of managing and operating the School Store and learn valuable skills in marketing, advertising, customer service, and entrepreneurship. Microsoft Office projects and legal office procedures allows seniors to attain more advanced Microsoft Office skills, prepare for Microsoft Office Specialist certification and learn legal office procedures. 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. Additionally, seniors focus on the study of entrepreneurship, including types of business entities, sources of capital, budget, cash flow, and human resource management. This study culminates in the preparation of an individualized business plan for a hypothetical business developed by the student. Through an on-line simulation, presented by Junior Achievement, students submit and analyze executive business decisions necessary to run a successful business.

Licensing/Certification: General Industry OSHA-Authorized Career Safe ® Online *Microsoft Office Specialist Master Certification:* Word, Excel, PowerPoint, Access, PowerPoint

Carpentry

Grade 9 Exploratory

The Exploratory program introduces freshmen to the many career opportunities that exist in the carpentry field. They are instructed on the safe and proper use of hand tools and given a brief introduction of the portable power tools and stationary power equipment used by carpenters. 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 size garden sheds 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 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.

Licensing/Certifications: Construction OSHA 10-hour Outreach Training Card Massachusetts Department of Labor Standards Lead-Safe Renovator-Supervisor Safety Certification (RRP).

Cosmetology

Grade 9 Exploratory

The Cosmetology Exploratory program exposes students to basic techniques and skills in the Cosmetology field. Students actively participate in practical assignments such as hair braiding, roller setting, shampooing, nail design, and facials. Each freshman receives an individualized hair and nail consultation, and accompanying services, with a junior cosmetology student. This will give the students insight into advanced courses taught within the program. Throughout these activities and demonstrations, students also learn the importance of sanitation and personal hygiene. 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 within both the practical and theory environments. Each week, students work toward successful attainment of a specific skill, such as facials, waxing, scalp care, roller setting, blow-drying, and manicures, by working on mannequins and one another. Students train in safety procedures on each piece of equipment necessary for a task. The sophomore students will continue to increase their skill level timing as they work toward proficiency in each area. Students will begin providing services on clients toward the end of the school year to prepare for the next phase. Additionally, sophomores perform salon duties such as receptionist training, daily and weekly salon operations, as well as, daily and weekly infection control and sanitation.

7207: Grade 10 Related

Sophomores begin their cosmetology related studies with intensive examination of safety and infection control, particularly bacteriology, decontamination, and blood borne pathogens. Students study general 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 hair-styling, 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 other students and outside clients by performing all of the services introduced sophomore year. Junior students will begin training in chemical texture services (permanent waving and chemical hair relaxing), hair coloring, bleaching, and foil highlighting. The junior students will learn how to measure and fit a client for wigs and other hair extensions. They observe a multitude of demonstrations by teachers, salon owners, and guest artists to expand upon their experience in these areas. Their leadership is enhanced, as they take on the role of mentors to the ninth graders going through the Cosmetology Exploratory. They manage the shop as receptionists with a focus on greeting clients, making appointments, answering phones, and beginning their training and use of the Hairmax software program.

7307: Grade 11 Related

The focus of the junior related curriculum is the chemical aspect of cosmetology. Students learn the chemistry and application techniques of various types of hair coloring products, such as permanent, semi-permanent, temporary, and lightening. Students then investigate the chemical composition of permanent waving chemicals such as alkaline, exothermic, acid-balanced perm waving. Students also learn about the chemical composition of chemical relaxers such as sodium hydroxide and thioglycolate. Additionally, students learn about hair wraps, soft curl relaxants, and thermal hair straighteners. This course places emphasis on the sciences, including general anatomy and physiology and chemistry.

8407: Grade 12 Shop

In shop, the final year is one in which senior students have the opportunity to 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. Our goal is to have seniors licensed and out on cooperative work placement as soon as they graduate their 1000-hour training and pass their State Board Examination.

7407: Grade 12 Related

A major focus of senior year related is salon management. Students develop a business plan for a salon, incorporating information they have learned regarding levels of shop ownership, accounting and taxation principles, pricing, advertising and marketing. Seniors also continue to prepare for the state exam for licensure in cosmetology.

Licensing/Certifications:

S/P2 Cosmetology for Career-Technical Education Safety Certification. Barbicide® Certification. At the age of sixteen, 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

Grade 9 Exploratory

The Culinary Arts exploratory program acquaints the student with the basics of the food service industry and includes time in the culinary arts kitchen, the Rams head ding room and bakery, with an emphasis placed on safety. Through rotations in kitchen stations such as the salad department, the hot range area, soup preparation, the dish room, and the dining room, students are exposed to the basic skills needed to succeed in a commercial kitchen. Similarly, the baking exploratory introduces students to mixing and bench work as well as the finish room. A full-service restaurant and retail bakeshop 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. 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, waiting on tables, and preparing a guest's check. In addition, throughout the year, instruction in safety and sanitation is

emphasized. The students will spend some of the time working in our bakery area that sells baked goods to the public in our retail store.

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 split between the commercial kitchen and bakery. 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 is explored through the use of 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. 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 and bakeshop, 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. Participation in inter-scholastic cooking and knowledge bowl competitions highlight the year.

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.

Licensing/Certifications:

Allergen Awareness Training, ServSafe® Certificate

Some additional fees may apply, including certification exams, state licensing exams, and industry-recognized credentials.

Dental Assisting

Grade 9 Exploratory

This week long 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.

9th Grade 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, a review of dental charting, preparation for patient care, mouth guard fabrication, patient education, and dental office management. Students also receive instruction in maintaining patient records, dental instrumentation, chair-side techniques, and responding to client needs. Anatomy and Physiology with a lab component, as well as Head and Neck Anatomy. Qualified students receive Infection Control Certification from the Dental Assisting National Board. Certification in CPR Basic Life Support BLS.

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 Certification, 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. Qualified students receive radiology certification from the Dental Assisting National Board. 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, preventative measures, and office management 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, interpretation, 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 cooperative program, students must meet all co-op requirements and be in good academic and vocational standing. Those students not on cooperative education will participate in a mandatory co-op externship affiliation. This externship will allow student to receive the 200 clinical hours needed for registration by the State of MA. The Students may participate in a clinical affiliation with both specialty and general practice dental offices. Students receive continued instruction in the areas of dental science and business office procedures.

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 Anatomy and Physiology of the Human Body Health and Illness.

Certifications:

Healthcare Pathways OSHA-Authorized CareerSafe ® Online, The American Heart Association Heartsaver®, First Aid and Basic Life Support 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 for 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), Design and Visual Communication

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 Communication 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

A comprehensive foundation level course covering the academic and trade disciplines of Typography, Color Theory, Graphic Design, Illustration, Digital Photography-Video, Production & Process, Animation, and Web Design. 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 comprehensive intermediate level course continuing the trade disciplines of Typography, Color Theory, Graphic Design, Illustration, Digital Photography-Video, Production & Process, Animation, and Web Design. Students will take knowledge gained from the grade 9 foundation level Design and Visual Communications, and continue in the development of the portfolio through intermediate level studio projects. These skills will be used to enhance and assist students in the integrated level portfolio development.

7221: Grade 10 Related

A comprehensive intermediate level course continuing the academic disciplines of Typography, Color Theory, Graphic Design, Illustration, Digital Photography-Video, Production & Process, Animation, and Web Design. Students will take 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 academic projects. These skills will be used to enhance and assist students in the integrated level portfolio development.

8321: Grade 11 Shop

A comprehensive integrated level course continuing the trade disciplines Typography, Color Theory, Graphic Design, Illustration, Digital Photography-Video, Production & Process, Animation, and Web Design. Students will take knowledge gained from grade 10 intermediate Design and Visual Communications and continue to apply trade principles to the development of the portfolio through studio projects. These skills will be used to enhance and assist students in the advanced level portfolio development.

7321: Grade 11 Related

A comprehensive integrated level course continuing the academic and disciplines of Management & Entrepreneurship, Employability, Typography, Color Theory, Graphic Design, Illustration, Digital Photography-Video, Production & Process, Animation, and Web Design. Students will take knowledge gained from grade 10 intermediate Design and Visual Communications and continue to apply theoretical and academic principles to the development of the portfolio through studio projects. These skills will be used to enhance and assist students in the advanced level portfolio development.

8421: Grade 12 Shop

A comprehensive advanced level course continuing the trade disciplines of Management & Entrepreneurship, Employability, Typography, Color Theory, Graphic Design, Illustration, Digital Photography-Video, Production & Process, Animation and Web Design. Students will take knowledge gained from grade 11 integrated Design and Visual Communications and continue to trade and academic principles to the development of the portfolio through studio projects. These skills will be used to enhance and assist in the job search and or entrance to a post-secondary Art, Design or Specialty institution.

7421: Grade 12 Related

A comprehensive advanced level course continuing the academic disciplines of Management & Entrepreneurship, Employability, Typography, Color Theory, Graphic Design, Illustration, Digital Photography Video, Production & Process, Animation and Web Design. Students will take knowledge gained from grade 11 integrated Design and Visual Communications and continue to apply theoretical and academic principles to the development of the portfolio.. These skills will be used to enhance and assist in the job search and or entrance to a post-secondary Art, Design or Specialty institution.

Licensing/Certifications:

General Industry OSHA-Authorized CareerSafe ® Online

Adobe Certified Associate in Visual Communication Using Adobe Photoshop

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 a 30 hours of a mix of shop and related studies followed by 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. Utilizing the latest release of AutoCAD Pro/Engineer's Creo and SolidWorks software. This course will cover: Navigating the CAD work environment, drawing setup, drawing objects, placing text, editing text and objects, introduction to 3-d solid modeling and managing object properties. The fundamentals of drafting are taught using a wide variety of multimedia and hands-on experience at a computer-aided-design (CAD) station. Students learn geometric construction skills to plan and create drawings of a mechanical and architectural nature. Field trips to drafting rooms in industry are planned whenever possible to raise student awareness of careers in the field.

8211: Grade 10 Shop

Sophomore students work on CAD workstations utilizing the latest release of AutoCAD and 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, 3D 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 will be cover all aspects of 3-D creation and generating working drawings form the 3-D designs. Projects with design and build aspects shall be followed up with the machine shop for possible build or the rapid prototype machine 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 entry level employment opportunities as well as post-secondary education. 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 formal drawings from design sketches by providing the student with the basic guidelines set by the program is divided into two (2) components; the first half of the year is dedicated to Residential Architecture the students are introduced to Home Design, Space planning, Landscape Architecture, and Building Codes. The second half of the year the students are introduced to Commercial Architecture And Light Commercial Construction as follows:

Site Plans and Grading

Elevations and Details

Floor Plans and Details

Building Codes and Procedures

In the shop portion of the program the students expand their skills to a higher level through hands on application in an Industry simulated environment in a state of the art cad lab.

7311: Grade 11 Related

In the Related (Lab) portion of the program the students learn the theory behind Residential and Commercial Drafting, in a modern classroom setting. The Computer Aided Drafting and Design program is designed to train students for entry level employment opportunities as well as post-secondary education. 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 formal drawings From design sketches by providing the student with the basic guidelines set by the American Institute of Architects (A.I.A).

8411: Grade 12 Shop

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

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 tolerancing and interchangeable sheet metal components will be discussed. Electronic components, electrical characteristics, and schematic diagrams will be taught. Rules of design will be taught for component boards, printed circuit boards and logic boards.

Instruction will also cover cables, harnessing for the preparation of shop electro/mechanical packaging project.

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 16-volt bell wiring and 120-volt circuits, which includes switches, lighting and receptacles. Shop projects include basic splicing of conductors and working with bell wiring and 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. 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. 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 house work 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.

Licensing/Certifications:

Construction OSHA 10-hour Outreach Training Card

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/Robotics

Grade 9 Exploratory

This course is designed to introduce freshmen to the electronics field and its many career opportunities. Basic electrical concepts and circuits are introduced and demonstrated in the shop. Through the hands-on construction of simple electronic projects, students learn proper hand tool use and soldering techniques. Students also perform activities and exercises exposing them to computer and robotic fundamentals. Safe operating practices in shop are discussed in detail.

8213: Grade 10 Shop

Students build upon their knowledge of AC/DC circuits and components while learning the proper use of electronic test equipment. Students also utilize computer-assisted instruction to create and simulate various electrical and electronic circuits. In addition, students build projects using proper fabrication and soldering techniques. Computer repair (both of hardware and operating systems) is also covered.

7213: Grade 10 Related

Sophomores cover DC electronics circuits and components, including the use of Ohm's Law, Watt's Law, and Kirchoff's Laws and network theorems in the study of series, parallel, series/parallel and voltage divider circuits. Study continues through the more advanced topics of AC/DC electronics, including the use of such components as capacitors and inductors in RC, RL, and RLC circuits. Additionally, more advanced computer repair topics are covered.

8313: Grade 11 Shop

Through the use of experimental labs the students build upon their knowledge of both semiconductor and digital components and circuits. Projects are chosen to enable student proficiency in the construction and troubleshooting of digital and analog circuits. Student time is split evenly between semiconductor analog and digital circuits. Computer aided instruction and schematic simulation programs are utilized to further student understanding of these topics.

7313: Grade 11 Related

This course takes the student from an introduction to basic semiconductor devices and digital concepts to more advanced circuits. The students spend significant time on semiconductor devices and circuits, including the study of diodes, LED's, bipolar junction transistor, field effect transistor, operational amplifiers and thyristors. In particular, students discover how these devices are used in power supplies, voltage regulators, small and large signal amplifiers, oscillators and control circuits. The other major focus is digital devices and circuits, ranging from binary and hexadecimal numbering systems and basic gates to more advanced devices and circuits such as flip-flops, shift registers, and binary counters. Truth tables, timing diagrams, Boolean algebra and Karnaugh Maps will be used in analyzing of digital circuits.

8413: Grade 12 Shop

Seniors in shop become more proficient in projects covering advanced semiconductors and digital electronics. The knowledge gained throughout previous courses will be used to complete projects to industry standards. Seniors who are eligible for co-op spend their shop weeks gaining valuable on-the-job training at various electronics firms.

7413: Grade 12 Related

This course continues the study of the semiconductors and digital electronics started in Junior Electronics. Advanced semiconductor topics in the areas of amplifiers, oscillators, and switching and control circuits are studied. Students are introduced to Microprocessors, PIC micro controllers, programmable logic devices and advanced topics in PC repair and networking. Students prepare for careers by learning employability skills, electronics career and education option, and portfolio/resume preparation.

*Licensing/Certification:***General Industry OSHA 10-hour Outreach Training Card**

Students prepare for the ETA Electronics certification exam and may sit for the tests either while they are students or after graduation. Some additional fees may apply, including certification exams, state licensing exams, and industry-recognized credentials.

Graphic Communication

Grade 9 Exploratory

The exploratory program acquaints freshmen with the many aspects of the graphic communications industry and the skills needed to be successful. Through rotations in the different areas of the shop and hands-on projects in each area, students learn basic skills in desktop publishing, prepress, offset press, binding and finishing and screen printing.

8214: Grade 10 Shop

Sophomore students rotate through four areas of the shop: Prepress, Press, Bindery and Customer Service. The Prepress area gives students a basic working knowledge of prepress technology as well as desktop publishing software. In the Press area, students learn the operation and controls of the press machinery, including color mixing. Sophomore in Bindery/Finishing learn binding and finishing methods such as cutting, GBC binding, stapling, stitching, drilling, folding, padding, collating, and packaging.

7214: Grade 10 Related

The sophomore related program in Graphic Arts provides students with an overview of the Graphic Arts industry and career options, particular focuses on the basics of prepress, desktop publishing, binding, estimating, and paper types and features. Shop safety, particularly equipment and chemical safety, is emphasized.

8314: Grade 11 Shop

Students continue their rotation among the various shop areas, perfecting their proficiency and developing both speed and skill. More advanced projects are presented in the Prepress and Press areas, offering students the opportunity to challenge themselves and their abilities. In the Bindery area, students hone their skills in binding and finishing. 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, output, print and bind themselves. In addition students are required to create and produce a multi-color Screen Printing project. They are beginning to work on outside production jobs which provides a valuable experience.

7314: Grade 11 Related

More advanced topics in Graphic Arts are covered, with an emphasis on presenting the theory behind the various projects students work on in shop. Shop safety continues to be stressed. Students also complete their OSHA 10-Hour training and begin preparing for co-op in the later part of the year. Students complete resumes and cover letters as well as participate in mock interviews.

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. 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.

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.

Licensing/Certifications:

General Industry OSHA 10-hour Outreach Training Card

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.

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.

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.

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.

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

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.

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.

Heating, Ventilation, Air Conditioning and 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. 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 small and large scale HVAC installations. Troubleshooting, servicing, and installing are covered in depth. The principles of refrigeration containment are also stressed.

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 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.

Licensing/Certifications:

Environmental Protection Agency (EPA) 608 - has four types of Certifications: (Type I) (Type II) (Type III) (Universal), R-410A Environmental Protection Agency Certification, The EPA section 609 Mobile Air-Conditioning Certification, Construction OSHA 10-hour Outreach Training Card

To sit for the Massachusetts State Refrigeration License Exam, Students can receive up to a maximum of 1,000 (3,000) hours as a Refrigeration apprentice 1,000 hours of Refrigeration classes of which includes the following:

Information Support Services and Networking/Programming and 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 networking. Students, working in teams, learn to disassemble a personal computer, identify and label each component, reinstall all components, and test it to assure full operation. They also create a database using Microsoft Access, and design their own website. Shop safety and career opportunities in the IT field are stressed.

8222: Grade 10 Shop

Sophomores in Information Support Services and Networking rotate through three shop areas: programming, networking and web design. PC hardware and software is covered in the programming track, through the A+ certification program sponsored by CompTIA. This industry standard program, which certifies the competency of an entry-level service technician, covers installing, configuring, troubleshooting and upgrading hardware and software. Basic computer network concepts are introduced, including basic functions of a network, various network designs, and network administration functions. Competencies covered this year also include a general understanding of the dynamic nature of the web itself and how it has evolved. Students develop a broad toolbox of web skills, including HTML, XHTML, Cascading Style Sheets, Adobe Photoshop and image manipulation, web site management, and introductions to both Flash and PHP. Additionally, all students create and maintain a functional web site to serve as a shop notebook. Sophomores also focus on Microsoft Office competencies, including word processing, spreadsheet, presentation software, and emphasizing Access database skills. Students also explore the foundations of computer programming, particularly the purpose and function of programming, programming terminology, and programming theory.

7222: Grade 10 Related

Sophomores in Information Support Services and Networking Related focus on the three areas they are rotating through in shop: programming, networking, and web design. Among the topics emphasized are programming and network theory, database development, and IT terminology. Career development is also covered.

8322: Grade 11 Shop

Based on their aptitude for and interest in the areas that all Sophomore Information Support Services and Networking students rotate through, juniors focus on one of the following concentrations:

Programming/Web/Database Track. SHP and JavaScript. Their online notebooks are improved and enlarged, and students are expected to take charge of at least one long-term project where they will build or maintain an educational, non-profit, or school web site. Students learn the basics of digital video production using Final Cut Express. Students are exposed to Access

database advanced features, including database relationships, data analysis, database macros and switchboards, advanced query and reporting functions and database startup and security options. Database programming using Visual Basic for Applications is also introduced and covers such proficiencies as customizing applications using event procedures, and writing functions. Students are introduced to Java programming. Topics covered are syntax errors and debugging procedures, introduction to control statements, introductions to defining classes and improving the user interface. Students develop a more complex understanding and use of CSS, Flash, and PHP. Additionally, they now begin an introduction to the use of MySQL in conjunction with P.

Network Track. The competencies covered in the 11th grade prepare the student for a number of career options in Network implementation, administration and support. Basic network fundamentals are taught based on the objectives of the Network+ certification sponsored by CompTIA. Instruction includes the Open Systems Interconnect (OSI) model, network media, protocols, IP addressing, network standards and network support. Particular emphasis is given to the use of decision-making and problem solving techniques. The competencies of the Microsoft Certified Professional (MCP) certification, an industry standard certification for professionals who implement, manage and troubleshoot networks, are also covered. The current curriculum, based on Windows XP, Windows 2000 and Windows 2003 operating systems, adapts as new systems are introduced. The Microsoft credential validates the specific skills required for the network and systems administrator job role.

7322: Grade 11 Related

The related program offers students in-depth theory of the technologies they cover in shop.

8422: Grade 12 Shop

Programming/Web/Database Track. All Web related projects from 11th grade are continued. Students also create a new long-term project in one of the following areas: web databases, digital video production, scripting languages, xml. A Fundamentals of UNIX® program provides an in-depth introduction to the CDE, GNOME, and KDE graphical user interfaces (GUI). An overview of the Sun Solaris and Linux versions of the UNIX operating system is provided. Also covered are fundamental command-line features of UNIX including file system navigation, changing file permissions, the vi and emacs text editors, Korn and Bash shell features, and basic network use. GUI features include Application Managers, File Managers, Text Editors, printing, and mail. Students also continue on the advanced database/VBA curriculum. Java advanced concepts will be introduced. Topics covered include to arrays, recursions, complexity, searching and sorting, as well as simple two-dimensional graphics, file classes, introduction to HTML and Applets, Swing and AWT philosophy.

Network Track. This year is an extension of the 11th grade competencies. We will also offer the student the opportunity to focus on specific areas of study like security, scripting, and web server support. We will focus on diagnosing and troubleshooting network problems.

7422: Grade 12 Related

Throughout their senior year, students develop a professional 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.

Licensing/Certifications:

General Industry OSHA-Authorized CareerSafe ® Online

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 manual lathes and milling machines, students fabricate flashlights, key chains, and whistles. 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 hands-on experiences in shop and learn the importance of improved tolerance on size and surface finish on work done on the lathe, drill press, milling machine, and surface grinder. Improvement in the use of hand tools and measuring tools, inspection and setup of machines replicates operations utilized in industry. Toward the end of the sophomore year, 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

Students learn the theory of different machining operations including, milling, drilling, turning, grinding, and types of cutting tools. Students also learn about print reading, measurement, dimensions, screw threads, non-traditional machining, with emphasis on machine tool safety. This course also focuses on shop math, with strong integration with MCAS math.

8316: Grade 11 Shop

Students build and expand their skills to a higher level, both in terms of accuracy and proficiency. Milling machining and surface grinding work (tolerance and finish are included) are introduced, and additional CNC skills are perfected. Students learn to utilize Mastercam computer-aided design software in conjunction with CNC Miller and Lathe. Juniors take an active role within the school by taking on repair work throughout the building and the district.

7316: Grade 11 Related

Students learn the importance 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, tool and utility grinders, stock cutoff machines, drills and drilling machine operations, lathe and cutting tools and tool holders, and cutting speeds. Students also study blueprint reading and shop math. Students learn programming techniques as they write programs using the Mastercam X software.

8416: Grade 12 Shop

Students become more skilled at various aspects of CNC, particularly operations of CNC conversational controls, CNC controls with a tool changer, CNC lathe controls, and programming tool paths. Senior students also study advanced layout, heat treatment, and production requirements. Co-op programs are available for qualified students to train in industry.

7416: Grade 12 Related

The major focus of senior year Related is CNC program writing. This is done with a two-fold approach. Students continue with a weekly lab using Mastercam X and begin learning G-Code, which is the actual language that CNC machines use to produce parts. Students also continue their studies in advanced machine tool technology theory and review blueprint reading. Discussion of issues and questions brought back from the job site by co-op students are also important elements of class. Students learn about the many careers and educational opportunities available to them upon graduation, for which they prepare by intensive resume preparation, job search strategies and college research, with special attention given to colleges with which the shop has articulation agreements.

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 and 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

Sophomores are introduced to all the tools used in the masonry field, complete with features, safety issues, maintenance and uses of each. Through a series of demonstrations and subsequent hands-on activities, students learn the basic techniques of brick and block bonding, jointing methods, and basic concrete flatwork.

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 blue print 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 cavity and composite walls, masonry supports, chases and bearings, chimneys expansion joints and rulers. Safe and efficient operation of various power equipment and safety practices are reinforced.

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, and tile. 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 blue print reading.

Licensing/Certifications:

Construction OSHA 10-hour Outreach Training Card

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 Lab Assistant as well as provide an understanding of the career path for the medical lab assistant. The student will be able to identify the instruments used by a Medical Lab Assistant for patient assessment. The student will learn basic first aid techniques, basic nutritional concepts and digestion, infection control techniques and spread of infection and basics of blood typing for donors and recipients. The course is designed to facilitate a conceptual overview of the Medical Lab 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 other human body from the cellular level through organ systems. They continue with in depth discussion and lectures of each body system: Skeletal, Muscular, Circulatory, Respiratory, Nervous, Special Senses, Integumentary, Endocrine, and Reproductive. 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 of 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, and 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 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 laboratory 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, and various other clinical procedures as performed by medical laboratory assistants. The student will also learn the entry-level skills for medical billing and coding, including basic ICD-9 and -10 and CPT codes. Students will learn to complete insurance forms, file, and complete financial duties of a medical office. During this year, students will participate in an externship program at Lahey Clinic to complete the requirements for AMT certification.

7415: Grade 12 Related

This course is designed to introduce the student to the science of psychology as a journey of discovery undertaken by both the researchers and themselves. 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.

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 NHA 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 and 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 and includes rules as well as operational procedures. Students learn how to identify various hand tools with which they will be working, as well as demonstrate their proper use. The wide range of job opportunities available in this field is also explored.

8219: Grade 10 Shop

The 10th grade shop program begins by reviewing the safety and operation of each machine in shop. All students are tested on each machine for proper and safe use. Students are assigned to equal times of welding/metal fabrication and sheet metal work. The goal for welding is proficiency in the Oxyacetylene processes and the Shielded Metal Arc Welding process as well as basic layout and design. The goal for the sheet metal area is to gain proficiency in Machine operations and at least two basic layout techniques, different seams involved in fabrication and various metal identifications.

7219: Grade 10 Related

The 10th grade related program is designed to blend with the shop program, beginning with critical safety issues on power tool, machine, and other equipment use. Topics covered include welding processes (oxy-acetylene, shielded metal arc and gas tungsten arc welding) and sheet metal equipment and functions. Additionally, sheet metal and welding mathematics and pattern drafting are covered throughout the year.

8319: Grade 11 Shop

Junior Metal Fabrication students are given equal time in welding and sheet metal. Emphasis in welding is placed on the shielded metal arc welding (SMAW) of various types of steel, including low hydrogen (7018), E6011, and E6010, in all positions. Students learn to examine and perform liquid penetrant (L.P.) tests on their welds to American Welding Society standards. Additionally, students learn to gas tungsten arc weld (GTAW) of mild steel, stainless steel, and aluminum. With both types of welding, students emphasize on quality of their projects rather than quantity. In sheet metal, students become skilled at using all machine processes that apply to fabrication of sheet metal parts, boxes, and ducts. They learn basic and advanced layout techniques, parallel line development, radial line development, and triangulation through their hands-on projects and activities. CNC Press Brake safety, set up and operation is introduced. CNC plasma cutting and layout of various parts is introduced. Safety is emphasized and reviewed throughout the year.

7319: Grade 11 Related

The focus of the junior related course continues with welding theory and coordinates with the welding processes learned in 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. 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.

8419: Grade 12 Shop

The main goal of the twelfth-grade program is to get students work ready by successful completion of a variety of increasingly complex projects in both the welding and sheet metal areas of shop. In metal fabrication/welding, students work from blueprints on various jobs assigned. They also practice areas of welding in which they need additional experience, following a progress chart set up for this purpose. In the sheet metal area, students utilize layout techniques learned in the previous years to fabricate the various fittings used in the construction area of the shop. Emphasis is placed on power machine safety and operation. Various outside jobs, which meet the learning needs of the students, are incorporated into the program. Students who qualify for co-op jobs are placed according to their ability and their desire to work in that specific area, thus gaining valuable experience in local welding and sheet metal shops.

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. Students explore job search strategies and career options within the industry.

Licensing/Certifications:

Construction OSHA 10-hour Outreach Training Card

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

American Welding Society (AWS) Certifications

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 a brief overview of the opportunities in the plumbing field and the knowledge and skills required to pursue a career in plumbing. Students are introduced to the fundamentals required to install and join copper tubing, cast iron soil pipe and thread steel pipe. They are taught shop safety, basic trade math, measurement skills, and licensing and career opportunities in the plumbing trade.

8220: Grade 10 Shop

At this level, students fabricate projects in all materials used for water distribution, sanitary drainage, ventilation, and gas projects. They also work on material identification and the selection and use of shop tools. Shop safety is strongly emphasized at all times during this course.

7220: Grade 10 Related

Students advance in their knowledge of plumbing through the use of textbooks, codebooks, demonstrations, lectures, and written examinations. The student learns to identify different fittings, pipes, hangers, and their uses. Basic trade math and science is also integrated into this course.

8320: Grade 11 Shop

Students at this level are introduced to the layout and fabrication of practical projects such as bathrooms, kitchens, etc. Shop safety is emphasized at all times since the students work more independently. They are also introduced to the repair and maintenance of appliances and equipment, as well as the practical application of plumbing theory. 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 exposes students to more advanced plumbing code theory through the use of the Plumbing codebook, demonstrations, lectures, and written examinations. The student work covers formulas, licenses, water heaters, cleanouts, trapping sanitary drainage, venting, and water distribution, and incorporates a more complex math and science skill set.

8420: Grade 12 Shop

Students at this level review the basics and then, with emphasis on safety, proceed with projects that will expand their skill in working with all types of pipes and fittings, fixtures, faucets, hot water heaters, tankless heaters, and gas appliances. Students gain more proficiency in all types of power and hand tools as well. If sufficient opportunities exist and the students are eligible, seniors may participate in the co-op program and work in the field for a Master Plumber, gaining valuable on-the-job experience.

7420: Grade 12 Related

The objective of this course is to advance and finalize student proficiency in the Plumbing codebook. Lessons focus on repair and maintenance, soil and waste pipe systems, private disposal systems, venting, cross-connections, gas systems, and hot and cold water systems.

Licensing/Certifications:

Construction OSHA 10-hour Outreach Training Card

ViegaPEX™ ProPress Pipe & Fittings 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

TracPipe Flexible Gas Corrugated Stainless Steel Tubing (CSST) Cert.

FlowGuard Gold® Chlorinated Polyvinyl Chloride (CPVC) Certification

Some additional fees may apply, including certification exams, state licensing exams, and industry-recognized credentials.

Project Lead the Way

Manufacturing jobs continue to be a vital part of our society, but the industry is dealing with a severe shortage of workers equipped with the knowledge and skills needed to function in advanced manufacturing workplaces. To help close the skills gap, Shawsheen Valley Technical High School has incorporated nationally accredited STEM (Science, Technology, Engineering, and Mathematics) curriculum into its Advanced Manufacturing Computer clusters, Drafting, Electronics, Machine Tool Technology and Programming and Web Development programs. Freshmen choosing the Advanced Manufacturing shops and Programming and Web Development will spend a portion of their daily shop experience enrolled in the Principles of Engineering (POE) course offering. As students transition to their sophomore year they will continue with the POE curriculum as part of their shop experience. At the conclusion of the first quarter of their sophomore year, students will begin the second pre-engineering experience, Digital Electronics. After a junior year devoted to honing their skills in their chosen shop, students will return to the third engineering experience, Computer Integrated Manufacturing (CIM) in their senior year.

8540: Principles of Engineering (POE)

Through the use of hands on activities and a prescribed on-line curriculum, students will be faced with a challenge requiring them to work in teams to solve a robotic problem. The students will use problem solving to discover the best solution for the problem. The goal will then be to build a mechanical device, create the proper programs for the device, and debug the hardware and software to achieve the desired outcome. It is through the use of these problem solving skills that students will gain an exploratory view of the requirements of Robotics, Engineering and STEM experiences.

8520: Digital Electronics

This course introduces students to applied digital logic theory, a key element in our technology driven society and used extensively with careers in advanced manufacturing. The course explores the “smart” circuits found in automobiles, cell phones, video games, alarm systems, smart home technology, computers and most important, computer integrated manufacturing machinery. Students use industry standard computer software to test, analyze, and eventually (later in the course) build digital circuits.

Computer Integrated Manufacturing (CIM)

Building upon the engineering design process introduced in Principles of Engineering and Digital Electronics, Computer Integrated Manufacturing focuses on the study of the manufacturing planning, integration and implementation of automation. CIM explores manufacturing history, individual processes, systems, and careers. This course reflects an integrated approach that leading manufacturers have adopted to improve safety, quality, and efficiency.