

# *Greater Lowell Technical High School*

*2020-2021 Program of Studies*



*Jill Davis, Superintendent-Director*

*Michael Barton, Assistant Superintendent/Principal*



## **Core Values**

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

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

### **R.E.A.C.H.**

**R**espect - We treat ourselves, others and our surroundings with dignity through words and actions

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

**A**ccountability - We own our words and actions and have the courage to accept responsibility for our decisions

**C**ommitment- We show dedication to our success, our school and our community

**H**onesty- We act with integrity and value the importance of truthfulness



# *Greater Lowell Technical High School*

## *School Committee*

**Paul E. Morin**  
Dracut, Chairperson

**Kempton P. Giggey**  
Dunstable, Vice-Chair

**Fred W. Bahou, Jr.**  
Lowell, Secretary

**Lee Gitschier**  
Lowell

**Curtis J. LeMay**  
Lowell

**George W. O'Hare**  
Dracut

**Matthew J. Sheehan**  
Dracut

**George A. Tatseos**  
Tyngsboro

### *Administration*

**Jill Davis**  
Superintendent-Director

**Michael Barton**  
Assistant Superintendent/Principal

**Alison Rihani**  
Director-Special Education

**Tracy Encarnacao**  
Director-Guidance & Counseling Services

**TBA**  
Director-Curriculum/Instruction & Assessment

### *Directors*

**Stacy Bezanson**  
**Mark Byrne**  
**Jamie Costa**  
**Lisa Martinez**  
**Kristin Foti**  
**Christine Messina**  
**Kathryn Tierney**  
**Michael Knight**  
**Mark White**  
**Linda Zambino**

Director-Cooperative Education/Placement  
Director-Plant Services  
Senior Assistant Principal  
Director-Technology, Enrollment & Information  
Director-Media and Professional Development  
Director-Practical Nursing & Continuing Ed. Programs  
Director of Human Resources  
Acting School Business Administrator  
Director-Athletics/Physical Education Cluster Chair  
Assistant Principal

### *Cluster Chairs*

**Carol Chisolm**  
**Arthur Cornellier**  
**Ronald Vercellone**  
**Maureen Griffin**  
**Daniel Hamel**  
**Margaret Sarmento**  
**Kathryn Palladino**

Science & Mathematics Cluster Chair  
Transportation/Manufacturing Cluster Chair  
Dean of Discipline & Attendance  
Personal Services Cluster Chair  
Construction Cluster Chair  
Technology Cluster Chair  
ELE-ELA-SS Cluster Chair

**William J. Collins**

Superintendent-Emeritus

### **Notice of Non-Discrimination in Education**

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

**Name and Title:** Tracy Encarnacao, Director of Guidance/Title IX Coordinator

**Address:** Greater Lowell Technical High School, 250 Pawtucket Boulevard

**Telephone:** (978) 441-4955

## A MESSAGE FROM THE SUPERINTENDENT-DIRECTOR

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

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

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

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

Sincerely,



Jill Davis,  
Superintendent-Director

*Working Copy 2020-2021*

# GREATER LOWELL TECHNICAL HIGH SCHOOL

## Mission Statement

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

## Philosophy

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

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

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

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

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

Greater Lowell Technical High School believes that all students regardless of race, color, national origin, sex, disability, religion, or sexual orientation have the opportunity to succeed through **technical and academic** programs and extracurricular activities.

## Goals

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

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

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

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

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

*Working Copy 2020-2021*

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**GREATER LOWELL TECHNICAL HIGH SCHOOL**  
**ADMISSION POLICY SUMMARY**

**ELIGIBILITY**

**Resident Students**

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

**School Choice/Nonresident (Chapter 74) Students**

Students who are not residents of the Greater Lowell Regional Vocational School District are eligible to apply as a School Choice student or a nonresident student under (Chapter 74) for fall admission subject to the availability of openings to Greater Lowell Technical High School provided they expect to be promoted to the grade they seek to enter by their local district. School Choice students or nonresident students under (Chapter 74) from other vocational technical schools are eligible to apply for fall admission or admission during the school year to grades 9-12 at Greater Lowell Technical High School provided they expect to be promoted to the grade they seek to enter by their current school. School Choice students or nonresident students under (Chapter 74) will be evaluated using the criteria contained in this Admission Policy.

**Transfer Students**

Applications from students who are enrolled in a state-approved (Chapter 74) vocational technical high school program in another school (transfer students) will be considered for admission (including admission during the school year) if they relocate away from their current school and wish to pursue the same program of study at Greater Lowell Technical High School. Their applications will be evaluated according to the provisions of this Admission Policy.

**McKinney - Vento**

Students who are homeless will be evaluated according to the selection criteria contained in this Admission Policy.

**Home School Students**

Students who are formally being home schooled may apply for admission to Greater Lowell Technical High School, including admission during the school year, provided all Admission Policy criteria are followed. The Home School Student's parent(s)/guardian(s) must submit a copy of the Home School approval letter from the local school superintendent and if current and prior year grades and/or prior school transcript are not available, a representative sample or portfolio of the student's body of work in English Language Arts or its equivalent, math, science, and social studies is required.

**APPLICATION PROCESS**

**APPLICATION PROCESS-FOR FALL ADMISSION TO THE NINTH, TENTH & ELEVENTH GRADE**

1. Students interested in applying to Greater Lowell Technical High School for fall admission to the ninth, tenth, or eleventh grade must:
  - a. Apply online, on the school's website, at [www.gltech.org](http://www.gltech.org) or apply during their visit to Greater Lowell Technical High School, in the fall, or at the January Open House, if applying for ninth grade. Ninth grade students, as well as tenth and eleventh grade applicants, who do not attend the visit or January Open

House, may apply online or obtain an online application from their local School Counselor or by contacting the Greater Lowell Technical High School Admissions Office as early in the school year as possible.

- b. Complete an application and inform their local School Counselor by the deadline set by the sending School's Counseling Department.

2. It is the responsibility of the local school School Counselor to:

- a. Complete their portion of the applications to the Greater Lowell Technical High School Admissions Office on or before February 1. Complete applications include:

- (i) Completed application form (including required signatures).
- (ii) For application to grade 9 (fall admission), the average of grade 7 and terms 1 and 2 of grade 8 marks in English Language Arts, social studies, mathematics and science from the local school report card/transcript are required.

For application to grades 10 & 11 (fall admission) the average of the previous two school year grades in English Language Arts, social studies, math and science from the local school report card/transcript are required.

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

For application to grades 10 & 11 (fall admission) the sum of the previous two school year's unexcused absences from the local school report card/transcript are required.

For application to grade 9 (fall admission), in-house and out of school suspensions from grade 7 and terms 1 and 2 of grade 8 are required from the local school counselor.

For application to grades 10 & 11 (fall admission), in-house and out of school suspensions from the previous two school years are required from the local school counselor.

For application to grades 9, 10, 11 & 12 (fall admissions), a recommendation from the local school counselor is required.

3. If incomplete applications are received, the following procedures will be followed:

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

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

1. Students interested in applying to Greater Lowell Technical High School for admission for the current school year must:
  - a. Apply online, on the school's website, at [www.gltech.org](http://www.gltech.org) or obtain an online application from their local School Counselor or by contacting the Greater Lowell Technical High School Admissions Office as early in the school year as possible.
  - b. Complete an application and inform their local School Counselor by the deadline set by the sending school's School Counseling Department.
2. It is the responsibility of the local School Counselor to:
  - a. Complete their portion of the application form.
  - b. Forward the completed applications to the Greater Lowell Technical High School Admissions Department. Complete applications include:
    - (i) Completed application form (including required signatures).
    - (ii) For application to grades 9, 10 & 11, (admission during the school year) the previous and current school year to the date of the application, grades in English Language Arts, social studies, math and science from the local school report card/transcript are required.

For application to grades 9, 10 & 11, (admission during the school year) the previous and current school year to the date of the application absences from the local school report card/transcript are required.

For application to grades 9, 10 & 11, (admission during the school year) the previous and current school year to the date of the application, the disciplinary record from the local school School Counselor is required.
3. If incomplete applications are received, the following procedures will be followed:
  - a. The Greater Lowell Technical High School Admissions Department will notify the local School Counselor responsible for submitting the application that the application is incomplete and will request completion.
  - b. The applicant's parent(s)/guardian(s) will be notified by the Greater Lowell Technical High School Department in the event that the problem is not resolved by the local school School Counselor.
  - c. If after notifying the local School Counselor and parent(s)/guardian(s), the application remains incomplete for twenty calendar days, the application will be voided.

### **LATE APPLICATIONS**

Applications received after February 1<sup>st</sup> will be evaluated using the same criteria as other applications, and the composite score will be integrated in rank order on the established wait list.

### **WITHDRAWN STUDENTS**

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

## **SELECTION CRITERIA**

Completed applications are processed by the Admission Committee using weighted admission criteria. Each applicant will be assigned a score derived from the sum of the sub-scores of the following criteria:

A. **Scholastic Achievement:** Maximum 40 points

<b>Grade Averages</b>	<b>Points</b>
90 – 100 (A)	10
80 – 89 (B)	8
70 – 79 (C)	5
60 – 69 (D)	2
0 – 59 (F)	0

For application to grade 9 (fall admission), the average of grade 7 and terms 1 and 2 of grade 8 marks in English, social studies, mathematics and science from the local school report card/transcript are used. For application to grades 10 & 11 (fall admission) the average of the previous two school year marks in English, social studies, mathematics and science from the local school report card/transcript are used. For application to grades 9, 10 & 11 (admission during the school year) the previous school year and current school year to the date of the application marks in English, social studies, mathematics and science from the local school report card/transcript are used.

B. **Attendance:** Maximum 40 points

<b>Number of Unexcused Absences</b>	<b>Points</b>
0 – 2	40
3-5	35
6-8	30
9-11	25
12-14	20
15-17	15
18-20	10
Over 20	0

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

For application to grades 10 & 11 (fall admission), the sum of the absences from the previous two school years from the local school report card/transcript are used.

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

C. **School Discipline/Conduct:** Maximum 40 points

The number of days a student has been suspended in school and out of school is recorded. Maximum points are awarded to students who have never been suspended.

Number of Suspensions	Points
0	40
1 In-School	30
1 Out of School	25
2 In-School	10
More than 2 In-School or 1 Out of School	0

Suspension data will be collected from local schools. The number of suspensions will be utilized to measure student discipline/conduct.

For application to grade 9 (fall admission), the sum of grade 7 and terms 1 and 2 of grade 8 suspensions will be utilized to measure discipline/conduct. For application to grades 10 & 11 (fall admission) the sum of the previous two school years will be used to measure discipline/conduct. For application to grades 9, 10 & 11 (admission during the school year) the previous and current school year to the date of the application suspension totals to be completed by local principals will be utilized.

D. Local School Counselor's Recommendation: Maximum 10 points

A member of the School Counseling Department in each member town will complete a recommendation based on a rubric in the application packet.

Rating	Points
Ability to Benefit	2
Classroom Participation	2
Perseverance	2
Study/Work Habits	2
Positive Attitude	2

## **SELECTION PROCESS**

Members of Greater Lowell Technical High School's Admission Committee will assemble to review all completed applications received by the first Friday in February. They will check each application for accuracy before awarding rating points in each category. After awarding rating points, each category will be totaled. The applicants will be ranked from high to low. Students listed above the cut-off score will be selected for admission. Those below the cut-off score will be placed on a Waiting List. The cut-off score is determined annually by ranking all applicants from top to bottom and selecting the number of applicants necessary to fill the Freshmen Class. All students and their local school counselors are advised of their admission status (accepted, waiting list) by the end of the first full week in April.

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

Applications received after the first Friday in February will be evaluated using the same criteria as other applications and their composite score will be integrated in rank order on the established applicant list.

## **ENROLLMENT**

In order to enroll at Greater Lowell Technical High School for the fall, applicants must have been promoted to the grade they wish to enter by their local district. In addition, they must have passed courses in English Language Arts or its equivalent and mathematics for the school year immediately preceding their enrollment at Greater Lowell Technical High School.

## **TECHNICAL PROGRAM PLACEMENT**

All ninth graders who enroll in Greater Lowell Technical High School participate in a technical exploratory program designed to help them learn about their talents and interest relative to a variety of different vocational-technical programs, including some that are non-traditional for their gender.

Students who enroll in Greater Lowell Technical High School after grade nine may select to explore a vocational technical program based upon available openings. Students are evaluated and graded by each shop teacher during the period of exploration.

Students are evaluated on four areas: Maximum 100 points

<b>Rating</b>	<b>Points</b>
Safe Use of Equipment/Efficient Use of Shop Specific Tools and Material Use	10
Performance Assessment	50
Coursework/Project Completion	20
Employability Skills/Conduct	20

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

Students who wish to transfer from one shop to another during the school year may apply for transfer no later than the end of the second quarter of the sophomore year by contacting his/her school counselor. Transfer requests will be considered subject to the availability of openings in the requested shops. If available, the student will be placed in a shop trial to determine the appropriateness of the transfer for the particular student.

## **REVIEW and APPEALS**

The applicant's parent(s)/guardian(s), upon receipt of a letter from Greater Lowell Technical High School indicating that the applicant was not accepted or placed on a waiting list, may request a review of the decision by sending a letter requesting a review to the Assistant Superintendent/Principal within thirty days of the receipt of the letter. The Assistant Superintendent/Principal will respond in writing to the letter with the findings of the review within thirty days. If after the review, the parent/guardian wishes to appeal the findings of the review they may do so by sending a letter requesting that they be scheduled to appear before the Superintendent-Director of Greater Lowell Technical High School to appeal the Assistant Superintendent/Principal findings. The Superintendent-Director will respond in writing to the parent/guardian with a scheduled date for the appeal within thirty days of the receipt of the letter. The Superintendent-Director will respond in writing to the letter with his decision on the appeal within thirty days of the meeting when the appeal was presented.

## ***CREDIT GUIDE SHEETS – GRADE 9-12***

### **9<sup>TH</sup> GRADE PROGRAM**

PAGE	ENGLISH	CREDITS
61	English 1 - Honors .....	6.0
61	English 1 - CP .....	6.0
	<b>MATHEMATICS</b>	
64	Algebra 2 - Honors .....	6.0
63	Algebra 1 - Honors .....	6.0
63	Algebra 1 - CP .....	6.0
63	Algebra 1 Extended - CP .....	12.0
63	Pre-Algebra .....	6.0
	<b>PHYSICAL EDUCATION/HEALTH</b>	
65	Teen Health. ....	3.0
65	Physical Education 9 <sup>th</sup> / Wellness .....	3.0
66	Adaptive Physical Education .....	3.0
	<b>SCIENCE</b>	
66	Biology - Honors .....	6.0
67	Biology 1 - CP .....	6.0
	<b>SOCIAL STUDIES</b>	
69	World History - Honors .....	6.0
69	World History - CP .....	6.0
21	Career and Technology Readiness .....	6.0
22-60	EXPLORATORIES& SHOP 1 .....	12.0
	<b><i>REQUIRED TOTAL CREDITS</i></b>	<b>48.0</b>

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## ***CREDIT GUIDE SHEETS – GRADE 9-12***

### **10<sup>TH</sup> GRADE PROGRAM**

<b>PAGE</b>	<b>ENGLISH</b>	<b>CREDITS</b>
61	English 2 - Honors.....	6.0
61	English 2 - CP.....	6.0
	<b>MATHEMATICS</b>	
64	Geometry - Honors.....	6.0
64	Geometry - CP.....	6.0
64	Algebra 1 - CP.....	6.0
	<b>PHYSICAL EDUCATION/HEALTH</b>	
66	Physical Education 10 <sup>th</sup> /Wellness.....	3.0
66	Adaptive Physical Education.....	3.0
	<b>SCIENCE</b>	
67	General Chemistry Hybrid/Lab 1.....	6.0
67	Biology 2 - CP.....	6.0
67	Chemistry - CP.....	6.0
68	Chemistry – Honors.....	6.0
	<b>SOCIAL STUDIES</b>	
69	U.S. History 2 - Honors.....	6.0
69	U.S. History 2 - CP.....	6.0
22-60	SHOP.....	21.0
	<b><i>REQUIRED TOTAL CREDITS</i></b>	<b><i>48.0</i></b>

## ***CREDIT GUIDE SHEETS – GRADE 9-12***

### **11<sup>TH</sup> GRADE PROGRAM**

PAGE	ENGLISH	CREDITS
62	English 3 – AP English Language and Composition .....	6.0
62	English 3 - Honors .....	6.0
62	English 3 - CP .....	6.0
	<b>MATHEMATICS</b>	
65	Pre-Calculus - Honors .....	6.0
64	Algebra 2 - Honors .....	6.0
65	Pre-Calculus - CP .....	6.0
64	Algebra 2 - CP .....	6.0
64	Functions & Number System .....	6.0
	<b>PHYSICAL EDUCATION/HEALTH</b>	
66	Physical Education Upper 1/Wellness .....	1.5
66	Upper Health I .....	1.5
66	Adaptive Physical Education .....	3.0
	<b>SOCIAL STUDIES OR SCIENCE CHOICE</b>	
	<b>SOCIAL STUDIES</b>	
70	U.S. History 3 - Honors .....	6.0
70	U.S. History 3 - CP .....	6.0
70	Topics in United States History 3 .....	3.0
	<b>SCIENCE</b>	
	AP Biology .....	6.0
67	General Chemistry Hybrid/Lab 1 .....	6.0
68	Physics – Honors .....	6.0
67	Physics - CP .....	6.0
67	Anatomy and Physiology - Honors .....	6.0
68	Anatomy and Physiology - CP .....	6.0
67	Chemistry - CP .....	6.0
68	Applications of Science – CP .....	3.0
69	Engineering Science - CP .....	3.0
	Biotechnology - CP .....	6.0
67	Environmental Science - CP .....	6.0
67	AP Environmental Science .....	6.0
71	Essential Concepts of Biology .....	3.0
	AP Biology .....	6.0
	General Chemistry Hybrid / Lab .....	6.0
22-60	SHOP THEORY .....	6.0
22-60	SHOP .....	21.0

***REQUIRED TOTAL CREDITS***

***48.0***

## ***CREDIT GUIDE SHEETS – GRADE 9-12***

### **12<sup>TH</sup> GRADE PROGRAM**

PAGE	ENGLISH	CREDITS
62	AP English Literature and Composition	6.0
62	English Composition 1 – Dual Enrollment	6.0
63	English – Honors	6.0
63	English 4 - CP	6.0
	MATHEMATICS	
64	Calculus	6.0
	AP Calculus	6.0
65	Pre-calculus – Honors	6.0
65	Pre-calculus CP	6.0
64	Algebra 2 - CP	6.0
65	Probability and Statistics – CP	3.0
65	Probability and Statistics - Honors	6.0
65	Algebra 2 / Probability and Statistics Applications - CP	3.0
	PHYSICAL EDUCATION/HEALTH	
66	Physical Education Upper 1 / Wellness	1.5
66	Upper Health 2	1.5
66	Adaptive Physical Education	3.0
	SCIENCE	
	AP Biology	6.0
67	General Chemistry Hybrid/Lab 1	6.0
68	Physics – Honors	6.0
67	Physics - CP	6.0
67	Anatomy and Physiology - Honors	6.0
68	Anatomy and Physiology - CP	6.0
67	Chemistry - CP	6.0
68	Applications of Science – CP	3.0
69	Engineering Science - CP	3.0
	Biotechnology - CP	6.0
67	Environmental Science - CP	6.0
67	AP Environmental Science	6.0
71	Essential Concepts of Biology	3.0
22-60	SHOP THEORY	6.0
22-60	SHOP	21.0

***REQUIRED TOTAL CREDITS***

***48.0***

## ***PROGRAMS AND SERVICES***

### **COLLEGE PREPARATORY PROGRAM**

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

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

1. Four courses of college preparatory English
  2. Four courses of college preparatory Mathematics
  3. Three courses of college preparatory Science (including three labs)
  4. Two courses of college preparatory Social Studies (including one course in U.S. History)
  5. Two years of technical program theory courses plus one an additional course in Mathematics, Science (no lab required), or Computer Science are accepted in lieu of foreign language for admissions to Massachusetts State Colleges.
- \* Students interested in applying to a four (4) year college/university should schedule an appointment during their junior year to ensure they are scheduled to meet admissions requirements specific to the colleges/universities they are applying to.

### **ACADEMIC LEVELS**

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

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

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

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

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

## Grade Point Average (GPA) Calculation

GLTECH uses a cumulative, weighted 4-point GPA calculation recommended by the Massachusetts Board of Higher Education<sup>1</sup>. Grade point averages are calculated based upon the grades earned in all high school level academic, technical, and exploratory courses. Grades earned in College Placement (CP) and technical courses do not receive extra weight. Grades earned in Honors, Advanced Placement, and Dual-Enrollment courses receive additional weight.

### *Calculating the weighted GPA*

Step 1. Convert each final, numeric grade to its equivalent on the 4-point scale.

Step 2. Weight grades by adding 0.5 to each converted grade earned in an Honors level course, and 1.0 to each converted grade earned in an Advanced Placement or dual enrollment course.

Step 3. Multiply each converted grade by the course credits earned. (Each course is assigned a specific number of credits based on the length and hours of the course.)

Step 4. Total the products from Step 3.

Step 5. Divide the total from Step 4 by the total number of course credits attempted.

Step 6. The quotient is the student's weighted GPA.

### *Conversion between numeric and 4-point grades:*

<b>Numeric Grade</b>	<b>4-Point Scale</b>		<b>Numeric Grade</b>	<b>4-Point Scale</b>
100	4.3		79	2.6
99	4.3		78	2.5
98	4.2		77	2.4
97	4.2		76	2.3
96	4.1		75	2.2
95	4.1		74	2.1
94	4.0		73	2.0
93	4.0		72	1.9
92	3.9		71	1.8
91	3.8		70	1.7
90	3.7		69	1.6
89	3.6		68	1.5
88	3.5		67	1.4
87	3.4		66	1.3
86	3.3		65	1.2
85	3.2		64	1.1
84	3.1		63	1.0
83	3.0		62	0.9
82	2.9		61	0.8
81	2.8		60	0.7
80	2.7		59	0

## **COURSE REQUIREMENTS**

All students are required to take four years of English Language Arts, four years of mathematics, three years of lab based sciences, two years of history/social sciences, and three years of a technical program. Students must receive a passing grade in English Language Arts for all four years, freshman and sophomore Science, and three

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

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

**State Mandate – Competency Determination** A student receives State Competency Determination when they score a 240 or better on the state mandated MCAS in English Language Arts and Math, and a 220 in Science. Students who do not score a 240 in either Math or ELA are placed on an Educational Proficiency Plan which requires them to successfully complete and pass 11<sup>th</sup> and 12<sup>th</sup> grade Math and English.

### **ENGLISH LANGUAGE LEARNERS PROGRAM**

Under the guidelines of Chapter 71A, the Greater Lowell Technical High School provides educational services to students who are identified as English Learners. The goal of the program is to help students increase their academic proficiency in English in order to achieve success in all interdisciplinary courses. All students in the ELL program receive intense instruction in English as a second language. In addition, ELL instructional support is provided by teachers and paraprofessionals to students in academic, technical and related classes in order to ensure student success in those courses. The specific amount of two-way instruction and tutorial support is based on the linguistic need of each student. Students are scheduled into mainstream courses as soon as their performance indicates that they will be able to succeed.

### **SCHOOL COUNSELING SERVICES**

The School Counseling Department at Greater Lowell Technical High School assists each student in reaching his/her potential in the attainment of a high school diploma by providing academic, technical and personal support. Whether the student plans to immediately enter the workforce or continue his/her education on the post-secondary level, counselors will monitor each student to assure that individual career and college goals may be achieved. A Career Inventory Survey is administered through Naviance to all freshmen to assist them in choosing the technical program that best suits their interests and abilities. Freshmen begin creating a career plan that they update every school year with the assistance of their school counselor to provide them with a four year college and career plan.

The School Counseling Department at Greater Lowell Technical High School assists each student to gain insight into understanding his/her environment, and needs and potential so that choices and decisions made will culminate in a successful and satisfying academic and career path.

School counselors provide a variety of student and community based services including, academic, career and postsecondary planning, and crisis intervention/resources. The School Counseling Office offers a comprehensive developmental guidance program consisting of individual and group sessions with students, as well as parent/guardian evening informational presentations. The administration, counselors, teachers, and students work together to promote the best interests of the school and the individual student. The focus of the school counselor is to work with the students and their parents/guardians in matters pertaining to academic advising, post-secondary planning, and personal/social counseling. This could include adjustment to school, registering for courses, placement in classes, college and career exploration, testing, tutoring, and personal/emotional issues. School counselors have access to a wide variety of community and collegiate resources in order to provide the students with the best possible options for all their needs. **Students should make appointments to see their school counselor unless the reason for the meeting is of a critical nature.**

Parents are encouraged to call or email their child's school counselor to make an appointment to discuss any areas of concern. Conferences may be arranged before or after school or at designated times during the school day.

Students who are referred for School Adjustment Counselor services will be issued a Strengths and Difficulties Questionnaire (SDQ) to help assess the focus for these appointments. The goal of the School Adjustment Counselor is to improve access to the curriculum by increasing coping skills for students struggling with social-emotional difficulties, thereby increasing time in classes. If you do not wish your student to take the SDQ, please inform your student's School Counselor in writing to opt out of this assessment.

## **STUDENT COURSE SELECTION**

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

## **COLLEGE & POST SECONDARY PLANNING**

School Counselors assist students in the following ways:

- Course Selection
- 4-year Career Plan
- Guided Naviance Student Activities
- College and Career Search process
- College majors and related careers
- PSAT/SAT/SAT Subject/ACT/ASVAB testing
- Resume/Essay writing
- College visits and interviews
- Financial Aid/Scholarships

Students are encouraged to utilize the resources available in the School Counseling office to assist them in this process. The School Counseling office has computers available to the students to aid them in obtaining information about colleges and careers.

## **NAVIANCE STUDENT**

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

Family Connection allows students and families to:

- Get involved in the planning and advising process: Build a resume, complete online surveys, and manage timelines and deadlines for making decisions about careers and post-secondary options.
- Research Careers: Research hundreds of careers and career clusters as well as take career assessments and interest inventories.
- Research Colleges: Compare your GPA, standardized test scores, and other statistics to actual historical data from our school for students who have applied to your college of interest in the past.
- Create plans for the future: Create goals and to-dos, and complete tasks assigned by the school to better prepare your student for future career and college goals.
- Track transcripts and recommendations: As a senior, once you have requested transcripts and recommendations you can see when those requests have been fulfilled.

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

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

### **LIBRARY MEDIA CENTER(IMC)**

The mission of the Library Media Center (LMC) is to enhance students' knowledge by providing them with resources that supplement their learning as they build research skills and become life-long independent learners.

Our team's priority is to provide students with up-to-date fiction and non-fiction materials and computer resources to encourage students to read, imagine, be informed and successful. We also offer an extensive number of on-line multimedia databases that are available to students, parents, and teachers at school and home that are accessible through our website at <https://www.gltech.org/domain/54>.

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

### **SPECIAL EDUCATION DEPARTMENT**

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

### **SECTION 504**

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

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

# ***EXPLORATORY / FRESHMAN PROGRAM OVERVIEW***

## **EXPLORATORY PROGRAM**

### **Pre-Exploratory**

The Grade 9 Pre-Exploratory provides all ninth grade students the opportunity to learn about each of the twenty-three (23) technical programs offered at Greater Lowell Technical High School. Students will spend one period in each technical program where they will be given a tour of the shop area and presented with an overview of the program and potential career paths.

### **Exploratory**

The Exploratory Program provides ninth grade students with the opportunity to learn about seventeen (17) technical programs they selected to explore. Students will spend two periods each day for (7) days in each of the seventeen programs. This will enable them to discover their personal strengths and interests, and compare these with the work skills and requirements of these seventeen (17) programs. Students are encouraged to consider training in any program, without regard to traditional stereotypes. At the end of each exploratory, students will receive an evaluation score. Exposure to seventeen (17) exploratory programs will enable students to make a more informed decision when making their final technical program choice. In the fourth marking period, students will select one of the seventeen (17) programs explored to pursue for the remainder of their high school experience. It is important that parents/guardians assist students with this selection process.

## **SHOP SELECTION PROCEDURE**

As noted previously, ninth grade students will make their permanent shop selection during the fourth marking period.

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

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

## **Exploratory Programs Offered**

Advanced Manufacturing  
Auto Collision Repair and Refinishing  
Automotive Technology  
Carpentry  
Computer Aided Drafting & Design  
Cosmetology  
Culinary Arts  
Design & Visual Communications  
Early Childhood Education  
Electrical  
Electronics Technology  
Engineering Technology

Graphic Communications  
Health Assisting/Pre-Nursing  
Heating/Ventilation/Air Conditioning & Refrigeration  
Hospitality  
Information Technology Services  
Marketing  
Masonry  
Medical Laboratory & Assisting  
Metal Fabrication & Joining Technologies  
Painting and Design  
Plumbing

## **SHOP 1**

Ninth grade students will begin to pursue study of their selected technical program in the fourth marking period. This shop course will be two periods per day for the entire marking period. Heavy emphasis will be placed on shop safety and basic shop concepts during this shop time.

## **CAREER AND TECHNICAL READINESS**

The Career & Technical Readiness course is provided to all ninth grade students in order to introduce the basic concepts and skills of all technical programs. The Vocational Framework Strands of Safety, Employability, Management & Entrepreneurship and Technology are introduced. These strands will be further developed and implemented when students attend theory classes in their selected shops for 11<sup>th</sup> and 12<sup>th</sup> grade.

## ***GRADE 10-12 TECHNICAL PROGRAM OVERVIEW***

### **TECHNICAL PROGRAMS**

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

Advanced Manufacturing/Manufacturing & Transportation  
Automotive Collision Repair and Refinishing/Manufacturing & Transportation  
Automotive Technology/Manufacturing & Transportation  
Carpentry/Construction  
Computer Aided Drafting & Design/Manufacturing & Transportation  
Cosmetology/Personal Services  
Culinary Arts/Personal Services  
Design & Visual Communications/Technology  
Early Childhood Education/Personal Services  
Electrical/Construction  
Electronics Technology/Manufacturing & Transportation  
Engineering Technology/Manufacturing & Transportation  
Graphic Communications/Technology  
Health Assisting - Pre-Nursing/Technology  
Heating/Ventilation/Air Conditioning and Refrigeration/Construction  
Hospitality Management/Personal Services  
Information Technology Services /Technology  
Marketing/Personal Services  
Masonry/Construction  
Medical Laboratory and Assisting/Technology  
Metal Fabrication and Joining Technologies/Manufacturing & Transportation  
Painting and Design/Construction  
Plumbing/Construction

# TECHNICAL COURSE DESCRIPTIONS

## **ADVANCED MANUFACTURING EXPLORATORY**

This exploratory includes an introduction to the machine trade as well as an overview of the career opportunities. Safety precautions, safety data sheets, fire safety, proper lathe operation and parts of the lathe are covered in this exploratory.

## **ADVANCED MANUFACTURING SHOP 1**

This course involves in-depth study on parts of the lathe operation, set-up, and safety. Other parts of the course cover safety, blueprint reading, CNC and Mastercam basics. Whenever possible, students are taken on a field trip to a local manufacturer to help the student make a more informed career decision.

## **ADVANCED MANUFACTURING SHOP 2**

This course provides reinforcement in the importance of improved tolerances on size and surface finish of machined parts. Instruction on personal safety equipment and safe working standards used in today's machine shops. How to safely setup and operate precision machining equipment. Instruction in setup and operation of manual lathes, manual milling machines, CNC turning centers, CNC milling centers, pedestal grinders, power saws and drill presses. Instruction of machine shop hand tools, portable power tools and precision measuring equipment. Instruction to include the latest Mastercam software for Computer Aided Machining.

## **ADVANCED MANUFACTURING SHOP 3**

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

## **ADVANCED MANUFACTURING THEORY 3**

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

## **ADVANCED MANUFACTURING SHOP 4**

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

## **ADVANCED MANUFACTURING THEORY 4**

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

### **Career Opportunities in Advanced Manufacturing: Entry Level Occupations**

Band Saw Operator

Drill Press Operator

Lathe Operator  
N.C. Miller Operator

Machine Operator  
Surface Grinder Operator

### **With Experience and/or Advanced Training**

CNC Machine Programmer  
Instrument Maker  
Jig and Fixture Maker  
Advanced Manufacturing Teacher  
Tool and Die Maker

Inspector  
Jig Borer  
Machine Setup Person  
Tool and Cutter Grinder

### **Related Occupations**

Machine Oiler  
Tool Crib Attendance

Material Handler

## **AUTOMOTIVE COLLISION REPAIR & REFINISHING EXPLORATORY**

This course emphasizes the basic skills needed in the automotive collision repair and refinishing trade, as well as the use of tools and application of procedures. Each student gains a working experience in the use of various tools and equipment used in this technical area. Our technical media system and the use of visual aids, as well as hands-on experience, provide students with an excellent introduction to a career in automotive collision technology.

## **AUTOMOTIVE COLLISION REPAIR & REFINISHING SHOP 1**

The Automotive Collision Shop 1 provides students with a more in-depth view of automotive collision repair procedures including: spray painting equipment; surface preparation of painted surfaces and metal; mixing and applying plastic fillers; care and use of power tools; methods of dent removal; and a thorough overview of career opportunities in the automotive collision and refinishing trade.

## **AUTOMOTIVE COLLISION REPAIR & REFINISHING SHOP 2**

This course provides students with the opportunity to acquire skills in: shop and personal safety procedures; MIG welding; pressure welding; cutting; care and uses of power tools, hand tools, and shop equipment; history of body and frame construction and computerized measuring system (Maxima 3000HE). Care and use of spray guns and spray equipment; analyzing and repair of metal and plastic panel damage including panel replacement; and spraying color coats. The analysis and repair of collision damage, producing computerized damage estimates, and the repair and replacement of automotive glass are also covered. All shop projects are based on I-CAR curriculum.

## **AUTOMOTIVE COLLISION REPAIR & REFINISHING SHOP 3**

The Automotive Collision Shop 3 program provides the student with a more in-depth study of automotive body repair and refinishing equipment. The course includes: analyzing and repairing areas of collision damage including frame and unit body repair utilizing the Maxima 3000 HE body alignment system and Eclipse laser frame measurement system. The Caroliner pressure spot welder will be utilized in all body panel replacement welds. Fiberglass and plastic body repair; repair to electrical system; front suspension service; and proper use and setup of the downdraft spray booth for refinishing will also be covered. Students will also participate in the Automotive Youth Education Systems program (AYES). All shop projects will be based on I-CAR Curriculum.

## **AUTOMOTIVE COLLISION REPAIR & REFINISHING THEORY 3**

This class includes automotive collision specific safety practices, I-car training, fasteners, measuring procedures, hand tools, power tools, analyzing structural damage, and cutting and welding.

## **AUTOMOTIVE COLLISION REPAIR & REFINISHING SHOP 4**

The shop 4 course provides the students with complete coverage of advanced automotive body repair, both major and minor, and most advanced types of paints used today, as well as methods of application. Other areas covered in this course include: analyzing and repairing major collision damage; MIG welding; pressure spot welding; major frame repair; determining when to repair or replace parts; estimating; and preparing for job interviews. The shop

4 students may also become eligible to enter the co-op program. Students may also participate in the Automotive Youth Education Systems program (AYES). All shop projects will be based on I-CAR Curriculum.

#### **AUTOMOTIVE COLLISION REPAIR & REFINISHING THEORY 4**

This class includes refinishing procedures, refinishing equipment and refinishing materials. Students will learn about solvent based paints as well as waterborne paints.

##### **Career Opportunities in Automotive Collision:**

###### **Entry Level Occupations**

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

###### **With Experience and/or Advanced Training**

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

###### **Related Occupations**

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

#### **AUTOMOTIVE TECHNOLOGY EXPLORATORY**

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

#### **AUTOMOTIVE TECHNOLOGY SHOP 1**

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

#### **AUTOMOTIVE TECHNOLOGY SHOP 2**

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

#### **AUTOMOTIVE TECHNOLOGY SHOP 3**

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

#### **AUTOMOTIVE TECHNOLOGY THEORY 3**

The theory 3 program consists of classroom theory using the Massachusetts VTEC frameworks and standards. Also, a complete review of engine repair, heating, air-condition, automatic and manual drive trains. Computer control systems are incorporated through up to date text and PC related programs as well as the SP2 Safety

program. We maintain an association with AYES (Automotive Youth Education System), ASE (Automotive Service Excellence) and NATEF (National Automotive Technical Foundation). Heavy emphasis is placed on preparing students for cooperative work opportunities within the community.

#### **AUTOMOTIVE TECHNOLOGY SHOP 4**

The shop 4 reviews skills acquired in previous levels and concentrates on diagnosing engine and running gear problems. Also included are the diagnosis of computer controlled ignition, fuel injection and pollution controls as well as front alignment. The students are familiarized with the practices and customs used in industry. Areas of concentration include electrical, electronics and engine performance, engine mechanical, engine measurement, scan tools and digital multi-meters. Along with computer-based training, students are prepped with employability skills enabling them to participate in the Cooperative Education program which is affiliated with the Automotive Youth Educational System (AYES).

#### **AUTOMOTIVE TECHNOLOGY THEORY 4**

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

#### **Career Opportunities in Automotive Technology: Entry Level Occupations**

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

Quick Lube Technician

#### **With Experience and/or Advanced Training**

Automotive Repair Shop Owner  
Electronic Diagnostic Specialist  
Factory Representative  
Service/Parts Manager  
Automotive Service Consultant/Advisor

Automatic Transmission Specialist  
Electronic Tune-up Specialist  
Front End Alignment Specialist  
Teacher

#### **Related Occupations**

Automobile Salesman  
Automotive Glass Installer  
Automotive Engineer

Automotive Parts Salesperson  
Small Engine Repair  
Insurance Appraiser

#### **CARPENTRY EXPLORATORY**

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

#### **CARPENTRY SHOP 1**

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

## **CARPENTRY SHOP 2**

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

## **CARPENTRY SHOP 3**

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

## **CARPENTRY THEORY 3**

The Carpentry program 11<sup>th</sup> grade student will be exposed to up-to-date information on building materials and techniques. Detailed coverage of all aspects of light framing construction, including site lay-out, foundation forming, sheathing, roofing, windows and doors, exterior finish, interior walls, floor and ceiling. Special emphasis is placed on the use of modern tools, materials and prefabricated components.

## **CARPENTRY SHOP 4**

12<sup>th</sup> grade Carpentry program students will each have the opportunity to participate in the cooperative education program, provided they are eligible. The student will learn the trade from a co-op employer who will report back to the school on the tasks performed and the level of competency achieved during this week. Students remaining in school will learn to set up woodworking machinery to do production work, while learning the care and maintenance of woodworking tools. The students will also work outside of the shop doing carpentry maintenance and remodeling work as needed inside and outside of the school campus. Students will support the junior building programs. Students may also work for the communities of Lowell, Dracut, Tyngsboro, and Dunstable.

## **CARPENTRY THEORY 4**

The 12<sup>th</sup> grade Carpentry program student will study advanced framing techniques, exterior and interior trim, the international residential code book will be used to cover Strand 1 Part 2.B.06 apply state and local building codes including the stretch code part of Strand 1 Part 2K.01 energy efficient systems in the carpentry frameworks.

### **Career Opportunities in Carpentry:**

#### **Entry Level Occupations**

Apprentice Carpenter	Assembler
Benchworker	Framer
Installer	Millworker
Roofer	Sider

#### **With Experience and /or Advanced Training**

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

#### **Related Occupations**

Building Inspector	Mill Supervisor
Estimator	Home Inspector

## **COMPUTER AIDED DRAFTING & DESIGN EXPLORATORY**

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

## **COMPUTER AIDED DRAFTING & DESIGN SHOP 1**

The freshman shop expands on the basics of design introduced in exploratory. Students will actively participate in practical design projects that will focus on research and development, prototyping, and the manufacturing process. We will begin to learn about multiple 3D CADD software programs to prepare for advanced training in college and career.

## **COMPUTER AIDED DRAFTING & DESIGN TECHNOLOGY SHOP 2 – INTRODUCTION TO ENGINEERING DESIGN/PRINCIPLES OF ENGINEERING 1**

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

## **COMPUTER AIDED DRAFTING & DESIGN TECHNOLOGY ADVANCED SHOP**

This course is based on an eight (8) term duration that provides in-depth training in the fields of residential architecture, landscape design, civil engineering, and mechanical drawing and design. The architectural segment covers a thorough look into the design and configuration of building trades incorporated within residential house construction. Students gain the skills required in room and space planning, interior elevations, roof plans, wall sections and detail permit process. In the civil/landscaping segment, students will learn landscape development design, and civil engineering concepts such as bridge design, ground contours, and surveying. The mechanical segment introduces students to various shop processes and focuses on reinforcing the students' skills in mechanical drawing and design. This segment introduces them to the engineering design process. Students gain knowledge of threads and fasteners, gears, and pattern developments along with other current industry related skills. Students will continue to develop their CADD skills throughout the year using the latest 2D and 3D CADD software while utilizing the rapid prototype machines (3D printing) and further developing their model making skills. Students are taught the use of various measuring instruments including micrometers and Vernier calipers. Students are required to design, draw, engineer and present a complete set of working drawings for a residential house and to design, draw, engineer and present a mechanical project of their choosing. Assistance is provided to help students determine career or college choices after graduation.

## **COMPUTER AIDED DRAFTING & DESIGN TECHNOLOGY 11<sup>TH</sup> & THEORY 4**

This course will introduce advanced concepts in the Architecture, 3D Animation & Gaming, and Design and Engineering career paths. We will expand on Architectural and Mechanical design in terms one and two. This will include reverse-engineering of parts, sheet metal design, general design and drafting theory and other advanced concepts needed to succeed in college or career. The student will work on employability skills throughout the year in preparation for co-op, college and job opportunities. At the end of semester one, the student will have a resume, portfolio and references that they will use to secure employment. Seniors will take part in a yearlong project of their own choice. Students can choose an Architectural, 3D Animation & Gaming or Mechanical project. This project will be instructed and graded as if they were in the workplace.

### **Career Opportunities in Computer Aided Drafting & Design:**

#### **Entry Level Occupations**

CADD Drafter I  
Computer Aided Design Drafter  
Architectural Drafter I  
Drafter I

CADD Drafter  
Architectural Drafter  
Mechanical Drafter I  
Level I Drafter

#### **With Experience and/or Advanced Training**

Industrial Architect  
Mechanical Design Engineer  
Automotive Design Engineer  
Architectural CADD Teacher  
Pipe Line Engineer  
CADD Operator  
CADD Manager  
Survey Manager  
Estimator

Residential Architect  
Industrial Design Engineer  
Engineering CADD Teacher  
Electrical Designer  
Structure Design Engineer  
Process Engineer  
Project Engineer  
Oil & Gas Election Engineer

#### **Related Occupations**

Architects  
Electrical & Electronic Engineering Technicians  
Electrical & Electronics Installers & Repairers  
Industrial Designers  
Mechanical Engineering Technicians  
Surveying & Mapping Technicians

Cartographers & Photogrammetrists  
Electrical & Electronics Engineers  
Electro-Mechanical Technicians  
Landscape Architects  
Mechanical Engineers  
Surveyors

## **COSMETOLOGY EXPLORATORY**

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

## **COSMETOLOGY SHOP 1**

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

## **COSMETOLOGY SHOP 2**

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

## **COSMETOLOGY SHOP 3**

This is the second year of the three (3) year state regulated course. The state requires a total of 1,000 hours to be completed by senior year. Students will review the basics that are learned in shop 2, and then develop them into more advanced competencies necessary to meet industry demanded standards. Units introduced and developed include: basic haircuts, various hairstyling techniques, perm winding, artificial nails, eyelash extensions, and a variety of hair color applications. Facials with massage and manicuring techniques are also practiced for state board regulation competency. Students will acquire skills to work in the clinical environment that is in place in Cosmetology Shop Level 3 and 4.

## **COSMETOLOGY THEORY 3**

Students during their junior year will continue to accumulating required state board hours. During this year students will develop the ability to analyze the theoretical part of cosmetology by demonstrating an understanding of disinfectants, skin care, hair color, nail care, artificial hair enhancements, and professional styling products. The curriculum will also expand students to real life expectations through role-play of an interview process, resume development and job searching using multiple resources. Juniors will continue to use the online software program that includes tests, reviews and comprehensive reports of their chapter progress. This electronic evaluation is a crucial resource in the student's preparation for the licensing exam. This program can also be accessed on their home computers. Once the students become fifteen years old, their class attendance hours will be added toward their goal of 1000 hours mandated by the State Board of Cosmetology for licensure.

## **COSMETOLOGY SHOP 4**

This is the third year of the three (3) year program. The mandatory 1,000 hours should be completed during this time. Shop 4 is conducted similar to an actual salon environment, whereas students perform various cosmetology services on actual clients. Students will be able to apply for state licensure upon accruing the mandated 1000 hours and successful completion of the program. Students participate in advanced color and hair cutting techniques, European aesthetics, and simulated salon/industry scenarios. Students participate in activities that enhance employability skills to prepare them for Cooperative Education and employment upon graduation.

## **COSMETOLOGY THEORY 4**

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

### **Career Opportunities in Cosmetology:**

#### **Entry Level Occupations**

Salon Operator  
Receptionist  
Salon Assistant

Nail Technician  
Aesthetician  
Waxing Technician

### **With Experience and/or Advanced Training**

Medical Aesthetician  
Product Demonstrator  
Salon Manager  
Cosmetology Instructor

Color Technician  
Make-up Artist for Theater  
State Board Inspector  
Wig Technician

### **CULINARY ARTS EXPLORATORY**

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

### **CULINARY ARTS SHOP 1**

In the first part of the Culinary Arts program students will focus on Knife skills, sanitation, personal hygiene and station setup. Students will be shown how to properly hold and use a knife to produce various knife cuts. Sanitation will be a daily objective as students will be taught the proper way to clean and sanitize work surfaces and equipment used in food product as well as how to properly wash their hands to prevent the spread of foodborne illnesses. Students will be prepared for Culinary Arts Shop 2, 3, and 4 by learning the expectations for uniform and station setup that will be used throughout all levels.

### **CULINARY ARTS SHOP 2**

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

### **CULINARY ARTS SHOP 3**

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

### **CULINARY ARTS THEORY 3**

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

## **CULINARY ARTS SHOP 4**

In the third full year of this three-year program senior students will run and operate a high production kitchen that services the Artisan restaurant which is opened to the public. High level hands-on training will ensure that the students are prepared to build a career within the culinary field. In addition to Co-op, the final year of this program involves the student with meat cookery, recipe conversion, cost analysis, and menu planning, managing food supplies and kitchen resources highlight this course.

## **CULINARY ARTS THEORY 4**

During the first two semesters, this course affords the opportunity to develop a strong foundation in the mathematical side of the foodservice industry as well as the opportunity to explore the idea of entrepreneurship. Students will create a working business plan for a food service establishment. The business plan will include, but is not limited to, marketing concepts, recipe cost analysis, and floor plan design. A team of students will be selected to present their business plan in a statewide competition hosted by the *National Restaurant Association*. For the third and fourth semesters students will be introduced to the science of baking and nutrition. Students will learn the functions of ingredients used in baking and will also look into alternatives for these ingredients that will meet a variety of dietary restrictions.

## **CULINARY ARTS CAFE SHOP 2**

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

## **CULINARY ARTS CAFE SHOP 2 THEORY**

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

### **Career Opportunities in Culinary Arts**

#### **Entry Level**

Server  
Dish and Pot Washer  
Prep Cook  
Cake Decorator

Banquet Server  
Bus Person  
Apprentice Baker

#### **With Experience**

Sous Chef  
Food and Beverage Manager  
Executive Chef

Restaurant Manager  
Pastry Chef

## Related Occupations

Entrepreneur  
Food Photographer  
Culinary Arts Teacher

Industry Sales Representative  
Research and Development

### **DESIGN & VISUAL COMMUNICATIONS EXPLORATORY**

The Design and Visual Communications Exploratory presents a broad overview of the graphic arts industry. Students explore their talents in graphic design, sketching, computer illustration, and digital photo enhancement. Students will be introduced to the industry standard software Adobe Design Suite. Employment opportunities in the area of Design & Visual Communications will be reviewed. This exciting curriculum takes a hands-on approach to complete several projects including developing a tattoo, and manipulating photography. The students are encouraged to express themselves creatively.

### **DESIGN & VISUAL COMMUNICATIONS SHOP 1**

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

### **DESIGN & VISUAL COMMUNICATIONS SHOP 2**

The Design & Visual Communications 10th grade shop provides the student with a broad curriculum and takes a hands-on approach to complete variety of projects in a shop setting. Students study introduction to the Design & Visual Communication industry preparing them to be able to explain color theory, effective typographical theory, define the principles and elements of design, review and apply mathematical knowledge and methods of measurement to a variety of projects. Photography basics will be introduced. Students will be given the opportunity to further their skills using the industry standard software Adobe Design Suite, while learning page layout, image editing, and computer illustration. Design & visual communications students will learn to enhance and apply their organizational skills. This shop is designed to prepare the student for more demanding work and assignments which will prepare him/her to be able to produce work that meets the standards of a professional design & visual communications person.

### **AP STUDIO ART PROGRAM**

Advanced Placement Studio Art has an emphasis on 2-D design, and suits those who are serious about furthering their experience in their own art. Students are self-motivated and committed to building a complete, and exemplary portfolio for submission to College Board, and in turn, receiving the experience of a college-level foundation course. Development of mastery in concept, composition, and execution of 2-D techniques, using the elements and principles of design, include activities related to illustration, digital photography and other creative forms of two dimensional art.

### **DESIGN & VISUAL COMMUNICATIONS SHOP 3**

In Design and Visual Communications 11<sup>th</sup> grade shop, students will begin preparing a thirty-piece portfolio of work that will be used for college and career readiness. There will be an emphasis on creative concept development, advertising and promotional design, observational drawing, illustration and photography. Students will participate in several contests and competitions, in addition to completing client-based production. Students will engage in presentations, creative writing prompts and critiques. An emphasis will be placed on employability skills, including time management and work ethic. Students will learn about workplace safety with the design field.

### **DESIGN & VISUAL COMMUNICATIONS THEORY 3**

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

### **DESIGN & VISUAL COMMUNICATIONS SHOP 4**

In Design and Visual Communications 12<sup>th</sup> grade shop 4, students will continue preparing a thirty-piece portfolio of work that will be used for college and career readiness. Students will continue to build technical skills learned in DVC Shop 3, including presentations, creative writing prompts and critiques. An emphasis will be placed on employability skills, including time-management and work ethic. Students will continue to learn about workplace safety with the design field. Students will be introduced to the process of video production, creating a script, storyboard and short film that will be shown in DVC's annual film festival. Both a printed portfolio book and a digital portfolio will be created to assist in obtaining employment. Students will present a portfolio of work to both college representatives and industry professionals for critique. Students will be encouraged to participate in cooperative education.

### **DESIGN & VISUAL COMMUNICATIONS THEORY 4**

Students will learn Adobe Animate. Through the process of creating characters, writing a story, and creating a storyboard student will create their own animation. Students will also focus on videography. Students will write scripts, plan, and video a project. Students will also focus on team building skills and career prep and will continue to work on employability skills.

#### **Career Opportunities in Design & Visual Communications:**

##### **Entry Level Occupations**

Airbrush Artist  
Calligrapher  
Free Lance Artist  
Illustrator  
Photographer  
Sign Artist

Book Designer  
Fashion Artist  
Graphic Designer  
Layout Artist  
Pre-Press Designer  
Sign Painter

##### **With Experience and/or Advanced Training**

Animator  
Cartoon Artist  
Desktop Publisher  
Layout Person  
Technical Artist

Art Teacher  
Computer Graphics Instructor  
Graphics Project Director  
Scenic Artist

##### **Related Occupations**

Art Director  
Layout and Design Person

Copy Preparation Person  
Production Manager, Advertising

### **EARLY CHILDHOOD EDUCATION EXPLORATORY**

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

### **EARLY CHILDHOOD EDUCATION SHOP 1**

This course outlines the duties and responsibilities of the teacher's assistant and the requirements for advanced study in early childhood education such as preschool teacher, lead teacher, or director. The student is exposed to in-depth information regarding "what" "how" and "why" children learn as they do in their early childhood years. Students spend time observing young children at play and mastering observation techniques. More time is spent in our campus preschool known as the "Tot Shop" working with three, four, and five year old children. Students learn specific teaching skills for working with children in each learning center of the preschool classroom and build their foundation of child development concepts. Students will continue to work on professionalism and employability skills for the job market.

### **EARLY CHILDHOOD EDUCATION SHOP 2**

Students in ECE Shop 2 begin attaining their knowledge of early childhood in a simulated ECE classroom. Students are introduced to developmental learning centers, appropriate guidance techniques, proper language and safety procedures for young children. Students practice conducting morning meeting, and have opportunities to observe and interact with the children in the preschool room. Special emphasis is placed on understanding basic child development, the use of developmentally appropriate practice and working as part of a "team" to meet the needs of young children. Sophomore students have the opportunity to obtain infant/child CPR & First Aid certifications.

### **EARLY CHILDHOOD EDUCATION SHOP 3**

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

### **EARLY CHILDHOOD EDUCATION THEORY 3**

This academic style course is an introduction to Child Development. Students will examine current theories of learning associated with early childhood, adolescent, and adult growth and development. Topics will include child guidance, health and safety, family and culture, special needs and how to create developmentally appropriate learning environments for children.

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

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

### **EARLY CHILDHOOD EDUCATION SHOP 4**

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

## **EARLY CHILDHOOD EDUCATION THEORY 4**

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

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

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

### **Early Childhood Education Shop 1**

This course is an introduction to the duties and responsibilities of becoming a teaching assistant in our on-campus preschool. Through hands-on activities, shop students learn to write their first lesson plans for preschool. A special emphasis of this shop will be on professionalism. Students will learn appropriate behavior for working in a preschool environment, as well as, confidentiality of the child. At the end of this course, students will have a beginner portfolio of lesson plans and products they created.

### **Career Opportunities in Early Childhood Education:**

#### **Entry Level Occupations**

Infant/Toddler Assistant Teacher or Teacher	Preschool Assistant Teacher
Kindergarten Aide in Public Schools	Before/After School Care
Day Care Center Aide	Nanny
Special Needs Aide	Camp Counselor
Group Leader at Family Day Care Provider	

#### **With Experience and a College Degree**

Public/Private School Teacher Grades Preschool -12	ELL/ESL Teacher
Special education Teacher	Guidance Counselor
Social Worker	

## **ELECTRICAL EXPLORATORY**

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

### **ELECTRICAL SHOP 1**

This course provides students with the fundamentals in wiring methods. Using basic hand tools, students demonstrate the skills required for low voltage. Students will wire projects using basic wiring methods including bell wire. Students will learn to install doorbell buzzers and chimes, single pole switches, 3-way and 40-way switches, light sockets, and duplex receptacles. Students learn how to draw and follow a wiring diagram. Electrical and hand tool safety is an integral part of the course.

### **ELECTRICAL SHOP 2**

This course was carefully designed for the purpose of assisting the young student with the basic fundamental skills necessary to continue on a path to a successful electrical career. His/Her electrical career should start with an

understanding of A/C electrical circuits and shop safety policies such as current OSHA regulations which cover electrical safety, ladder safety, tool safety, and personal protective equipment to name a few which are essential for a safe working environment.

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

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

### **ELECTRICAL SHOP 3**

This course is a continuation of the shop 2. Emphasis is placed on proper wiring techniques and the National Electrical Code. Hands-on wiring of single phase installations which are used in residential and industrial establishments is covered in this course. Wiring methods will include non-metallic sheathed cable, metal clad cable, electrical metallic tubing, rigid metal conduit, surface metal raceway, and rigid non-metallic conduit. This course also offers conduit bending techniques using a PVC heater box, hickey benders, hydraulic benders and more complex hand bending. Students also deal with lighting, solar energy installations, motor controllers and systems, electric heat, and electrical maintenance; this includes 100 and 200 amp residential services, lighting circuits, relays, time-clocks, and new building construction. Students will also be involved with an on-site house building program. The shop 3 students will be eligible for co-op education after completion of the 2<sup>nd</sup> quarter. During this year, we are also continuing to prepare students to enter the workforce through resume writing and weekly job site safety talks. Students in this level are eligible for co-op education which is highly encouraged.

### **ELECTRICAL THEORY 3**

The Electrical Theory 3 program includes the science, electrical code and drawing information related to the successful completion of shop projects for 11<sup>th</sup> grade. The students will become knowledgeable in the areas of the function of specific pieces of equipment, electrical code interpretations for general and specific wiring methods, and how to prepare and understand the drawings used in the residential installations.

### **ELECTRICAL SHOP 4**

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

### **ELECTRICAL THEORY 4**

This course includes the science, electrical code and drawing information related to the successful completion of shop projects for 12<sup>th</sup> grade program. The student will become knowledgeable in the areas of: the function of specific pieces of equipment, Electrical Code interpretations for general and specific wiring methods, and how to prepare and understand drawings used in industrial and commercial installations.

## **Career Opportunities in Electrical: Entry Level Occupations**

Electrical Apprentice  
Electrician's Helper

Electrical Supply Company Worker  
Solar Energy Installation

### **With Experience and/or Advanced Training**

Business Agent for Electrician Union  
Electrical Contractor  
Journeyman Electrician  
Teacher

Electrical Advisory Committee  
Electrical Instructor  
Master Electrician  
Wiring Inspector

### **Related Occupations**

Alarm Installer  
Power Company Lineman  
Service Representative

Electrical Cost Estimator  
Power Plant Operator

## **ELECTRONICS EXPLORATORY**

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

## **ELECTRONICS SHOP 1**

The shop one student is prepared for entry into the 10th grade shop program through a structured, introductory electronics curriculum. The student will be re-introduced to electronic terminology, component identification, and circuitry. The student will build a simple electronic project using standard electronic components and hand tools. The student will be introduced to computer system concepts, fundamental computer hardware and computer controlled circuitry. Using a microcontroller, they will experience the effect of programming code on various sensors and motors. Summary: This is the introduction into the Design, Fabrication, and Test of DC and AC Circuits.

## **ELECTRONICS TECHNOLOGY SHOP 2 - ANALOG ELECTRONICS**

This is a foundation course designed to prepare the student for further study in the engineering and technology fields. The student will demonstrate health and safety practices, learn the use of measurement devices, assemble electronic circuits, use electronic hand tools and equipment, select and use DC and AC instruments, and apply electronics theory to the engineering design process. The student will select the use of discrete semiconductor instruments, apply electronic principles, perform calculations and apply electronic principles of semiconductor circuits. Students continue with the study of analog electronics with an introduction to advanced semiconductor operation. The student will perform experiments in the areas of power supplies, voltage regulation, and filter circuits. Next the students will construct and test semiconductor amplifiers and determine the operating parameters of these devices. The course continues with an introduction to operational amplifiers (op-amps), field effect transistors (FETs), silicon controlled rectifiers (SCRs), and various uses for the 555 timer. Construction projects and labs will supplement all instruction. Labs will be constructed with hands-on trainers and breadboards as well as use of the Multisim software program. Throughout the course the students will demonstrate and develop language arts and communication skills, apply mathematical strategies to solve problems, apply science and engineering technology strategies (STEM), solve problems using critical thinking, demonstrate positive work behaviors; demonstrate ability to use technology for research, problem solving and communication. Students are introduced to basic electricity and electron theory, basic DC theory and circuitry, involving Ohm's Law, Watts Law, circuit components, multiple load circuits, meter construction and reading, basic AC circuitry involving magnetism, electromagnetism, capacitance, inductance, transformers and RC and L circuits. Also covered are

semiconductors, diodes, transistors and power supplies. The student will also utilize computer-aided instruction (CAI) as a supplement to the classroom and textbook material. Students will receive an introduction to computer hardware and computer operating systems. All theory will be verified using hands-on experiments in the shop.

***Summary: This is achieving the competencies associated with the Design, Fabrication, and Test of DC and AC Circuits. Provide the opportunity for an IPC J-STD-001 Soldered Electrical and Electronic Assembly Industrial Certification.***

### **ELECTRONICS TECHNOLOGY SHOP 3 - DIGITAL ELECTRONICS**

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

### **ELECTRONICS TECHNOLOGY THEORY 3- ELECTRONICS TECHNICIAN ASSOCIATE LEVEL 1**

The 11th Grade course is intended for electronics technician students, who are seeking the status of CERTIFIED ELECTRONICS TECHNICIAN, ASSOCIATE LEVEL (CETa). It prepares students to become Journeyman (GET), Senior (CETsr) or Master (CETma) CETs. Topics range from Electronic Components and Semiconductors, AC and DC Circuits, Analog Circuits, RF, Cabling and Telecommunications. The students become a better technician with a solid core of basic electronics knowledge like that found at ITT Tech. Course material include (The Associate CET Study Guide, 6th Edition, Published by ETA® International) and (Introduction to Electronics, 6th Edition, by Earl Gates).

ETA International represents a wide variety of professionals from many industries, including: Avionics, Biomedical, Data Cabling, Fiber Optics, Gaming & Vending, Industrial Electronics, Information Technology, Renewable Energy, Smart Home, and Wireless Communications. ETA also offers FCC Commercial Radio Operator licensing. Employers worldwide choose ETA-certified professionals because of ETA's certification programs' competency criteria and testing benchmarks that conform to the highest international electronics standards. ***Summary: This is to achieve the competencies for the "ETA® International CERTIFIED***

***ELECTRONICS TECHNICIAN, ASSOCIATE LEVEL (CETa)" Industrial Certification.***

### **ELECTRONICS TECHNOLOGY SHOP 4**

This course is designed to prepare the student to take the "Student Electronic Test" (SET) certification given by Electronics Technician Association International (ETA). This is a nationally recognized organization which has developed a basic set of knowledge standards and competencies for the electronic industry. This organization has major input and influence on the Massachusetts frameworks for electronics. The program covers 22 chapters including: DC electronics, AC electronics, components and semiconductors, analog circuits, cabling & telecommunications, digital circuits, microprocessors, troubleshooting, repair, test equipment, and service management.

Students will be instructed on the practical aspects of constructing a computer. This includes preparing the motherboard by installing the CPU, CPU fan and memory DIMM. Installing the power supply, video card, NIC card, sound card, audio card and peripherals are also taught. Installing the operating system and test the functionality of the computer after it is built. Students will also be instructed on how to set-up a small network, how to share printers, files and other resources in a Server-Client environment.

***Summary: This is achieving the hands-on competencies associated with the Introduction to CISCO Networking Academy's IT Essentials "Computers and basic Networking", Audio, Video, RF and Robotics.***

## **ELECTRONICS TECHNOLOGY THEORY 4-ELECTRONICS TECHNICIAN ASSOCIATE LEVEL 2**

The 12th Grade course is a continuation of the 11th Grade CET course. Topics range from Microprocessors, Transmitters, and essential skills every Certified Electronics Technician needs such as Record Keeping and Technical Writing. Each chapter is followed by a practice quiz and the entire guide is covered in a final practice examination, which will further prepare an individual for the CETA examination.

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

IT Essentials curriculum helps students prepare for entry level IT career opportunities and the CompTIA A+ certification.

CISCO Networking Academy CCNA Discovery covers general networking theory and the basics of routing, switching, and advanced technologies within the context of environment for home and small office networks.

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

### **Career Opportunities in Electronics Technology:**

#### **Entry Level Occupations**

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

#### **With Experience and/or Advanced Training**

Audio Visual Engineer	Computer Design Engineer
Electrical & Electronics Engineer	Electromechanical Inspector
Electronics Instructor	Electrical & Engineering Assistant

Licensed Radio-Television Technician  
Production Line Supervisor  
Telecommunications Engineer  
Electrical & Electronics Installers & Repairers  
Electronic Equipment Fabricator

Microwave Engineer  
Satellite System Designer  
Calibration Technician  
Test Equipment Technician  
Home Entertainment Technician

### **Related Occupations**

Audio Visual Security Technician  
Certified Network Associate  
Electro Optical Engineer  
Network Security Specialist

Automotive Electronics Technician  
Medical Electronics Technician  
Environmental Control Technician  
Radar Engineer Robotics Engineer

## **ENGINEERING TECHNOLOGY EXPLORATORY**

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

## **ENGINEERING TECHNOLOGY SHOP 1**

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

## **ENGINEERING TECHNOLOGY SHOP 2 – INTRODUCTION TO ENGINEERING DESIGN/PRINCIPLES OF ENGINEERING 1**

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

## **ENGINEERING TECHNOLOGY SHOP 3 – COMPUTER INTEGRATED MANUFACTURING (PROJECT LEAD THE WAY)**

This course from Project Lead the Way is the study of modern manufacturing techniques that are used to produce complex objects as components in familiar products. Manufactured items are part of everyday life, yet most students have not been introduced to the high-tech, innovative nature of modern manufacturing. This course illuminates the opportunities related to understanding manufacturing. At the same time, it teaches students about manufacturing processes, product design, robotics, and automation through coding, advanced simulation and

manufacturing equipment. Students can earn a virtual manufacturing badge recognized by the National Manufacturing Badge system. This course can lead to college credit.

### **ENGINEERING TECHNOLOGY SHOP 3– CIVIL ENGINEERING AND ARCHITECTURE (PROJECT LEAD THE WAY)**

In the 11<sup>th</sup> grade Civil Engineering and Architecture students will study surveying basics and data collection related to surveying. The students will extend their work with the Autodesk Architectural CAD program to plot their survey points and design commercial building site features. The focus will be on Civil Engineering and different municipal systems and infrastructure. For example, electrical power distribution, drinking water distribution, drain collections, roads and bridges. This will directly support the Civil Engineering projects that are a key part of the junior year engineering curriculum shop class. In addition, students will work on real word employability skills that will prepare them for possible co-op placement and employment after graduation. This course can lead to college credit.

### **ENGINEERING TECHNOLOGY THEORY 3 - DIGITAL ELECTRONICS (PROJECT LEAD THE WAY)**

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

### **ADVANCE ENGINEERING TECHNOLOGY SHOP 4**

The senior year students will develop advanced Computer Integrated Manufacturing and Municipal Operations projects as well as complete a Capstone project, or the student will participate in a cooperative education job. The advanced projects will further the student's capabilities building upon their junior year experience and often aligning with SkillsUSA or other extracurricular competition opportunities. The Capstone is a yearlong journey where the individual student is allowed to choose a topic that they are passionately interested in and is related to engineering design and their engineering experience to date. Some of the past projects are: powered skateboards, human-mimicking robot, quadcopters, solar trackers, a system which monitors and protects occupants against high temperature in parked car and many more! Cooperative education jobs are directly replace the student's shop course with real-world work experience in Engineering-related positions, some past partnering employers include: BAE systems, Segue Manufacturing, Granite Group, Somerset Industries as well as others.

### **ADVANCED ENGINEERING TECHNOLOGY THEORY 4– SENIOR PROJECT**

The senior project is a yearlong journey where the individual student is allowed to choose a topic that they are passionately interested in, that is related to engineering design and their engineering experience to date. The goal of the senior project is for the student to work with an outside expert in their field/topic of choice to help guide the process. There are guide points online on the Senior Project Web Page on X<sub>2</sub> which will help focus the timing and outcome of the senior project. Some of the past projects are: Boosted Boards (skate boards), Electrathon Vehicle, Bomb Detecting Robot, Video Games, a horse barn design for the Mass Society for the Prevention of Cruelty to Animals, a car alarm which prevents a parked car from having occupants when the temperature gets too high, a pollution control project and many more!

#### **Career Opportunities in Engineering Technology:**

##### **Entry Level Occupations**

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

## Mechanical Engineering Technicians

### **With Experience and/or Advanced Training**

Industrial Architect

Mechanical Design Engineer

Automotive Design Engineer

Architectural CAD Teacher

Pipe Line Engineer

CAD Operator

CAD Manager

Survey Manager

Estimator

Industrial Designers

Residential Architect

Industrial Design Engineer

Engineering CAD Teacher

Electrical Designer

Structure Design Engineer

Process Engineer

Project Engineer

Oil & Gas Election Engineer

Electrical & Electronics Engineers

Mechanical Engineers

### **Related Occupations**

Architects

Electrical & Electronic Engineering Technicians

Electrical & Electronics Installers & Repairers

Industrial Designers

Mechanical Engineering Technicians

Surveying & Mapping Technicians

Cartographers & Photogrammetrists

Electrical & Electronics Engineers

Electro-mechanical Technicians

Landscape Architects

Mechanical Engineers

Surveyors

## **GRAPHIC COMMUNICATIONS EXPLORATORY**

The Graphic Communications Exploratory presents a broad overview of the graphic arts industry. In the printing/production area, emphasis is placed on production procedures that encompass all aspects of the printing industry. Students are exposed to printing/production, the integrated computer graphic systems, offset press, bindery, prepress, screen printing, high speed digitized imaging processes and vinyl sign production. This exciting curriculum takes a hands-on approach to complete several projects involving the offset press, and create a bound notebook using a cover of their own design. Employment opportunities in the area of graphic communications will be reviewed.

## **GRAPHIC COMMUNICATIONS SHOP 1**

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

## **GRAPHIC COMMUNICATIONS SHOP 2**

The Graphic Communications 10<sup>th</sup> grade shop provides the student with a project-based approach curriculum and to complete variety of projects. Students will be learning the industry standard software on the Adobe Creative Cloud platform. The hands on projects teach graphic design software tools and techniques entirely within the Graphic Communications framework of real-world projects. Students will also be prepared in the following disciplines such as color theory, typography, principles and elements of design, apply mathematical knowledge and methods of measurement to a variety of projects. Students will learn to enhance and apply their organizational skills. Students will be required to define computer platforms and operating systems. Graphics students will also learn how to use a scanner to scan images from different digital sources for a variety of uses. This program is designed to prepare the student for more demanding work and assignments which will prepare him/her to be able to produce work that meets the standards of a professional graphic communications person.

### **GRAPHIC COMMUNICATIONS TECHNOLOGY SHOP 3**

The Graphic Communications 11<sup>th</sup> grade shop specialize in printing production, digital graphics and prepress. In the printing/production area, emphasis is placed on production procedures that encompass all aspects of the printing industry. Students are given experience in the form of integrated computer graphic systems, offset press, bindery, prepress, and proofreading, screen printing, high speed digitized imaging processes and garment embroidery. Students will learn to apply organizational skills. Students will be given the opportunity to demonstrate pre-production, production and effective post-production practices. Students will learn to correctly scan images from different sources for a variety of uses, will learn to describe and apply photographic principles, and will learn to lay out a page using desktop publishing software and will learn to edit and create digital images using digital imaging software. Students will have the opportunity to create, design and layout a sign.

### **GRAPHIC COMMUNICATIONS TECHNOLOGY THEORY 3**

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

### **GRAPHIC COMMUNICATIONS TECHNOLOGY SHOP 4**

The Graphic Communications 12<sup>th</sup> grade shop is given in a graphic arts/director/client atmosphere. Professional level problems will be stressed and solved with a concentration on layout, design, and the preparation of production. The course content will provide for a realistic development of job phases with respect to offset printing, bindery, silk screening, typesetting requirements, electronic graphic design and garment embroidery. Emphasis is placed on production in the form of electronic page preparations. This course will give students hands-on experience with a computer generated graphic, page layout and typesetting network. The student will be exposed to advanced black and white, as well as printing on demand multicolor and four color process printing. Students will be responsible for completion of jobs from layout and design to type face selection. In most instances, the student acts as a journeyman's apprentice. Students will also learn to enhance and apply their organizational skills. Students will learn to demonstrate effective pre-production, production and post-production, and publication practices. Students will be required to apply photographic principles, layout and design pages using page layout software and integrate edited digital images. At an advanced level, students will also be required to create, design and layout vinyl signage. Students will demonstrate the use of a vinyl cutter/plotter. Students will describe and demonstrate various methods for transferring graphics, demonstrate the use of a stencil, and demonstrate methods of producing lines and stripes.

### **GRAPHIC COMMUNICATIONS TECHNOLOGY THEORY 4**

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

#### **Career Opportunities in Graphic Communications Technology:**

##### **Entry Level Occupations**

Entry Level Graphic Designer  
Press Assistant / Operator  
Copy Center Operator  
Silk Screen Assistant

Plate Maker  
Pre-Press Assistant  
Bindery Assistant

##### **With Experience and/or Advanced Training**

Project Director

Printing Press Operator

Print Production Manager  
Bindery Manager  
Lead Press Operator

Operations Manager  
Mailroom Manager  
Silk Screen Operator

### **Related Occupations**

Copy Preparation Person  
Production Manager, Advertising  
Art Director

Layout and Design Person  
Marketing Manager  
Printing/Advertising Sales

## **HEALTH ASSISTING/PRE-NURSING EXPLORATORY**

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

## **HEALTH ASSISTING/PRE-NURSING SHOP 1**

Health Assistant/Pre-Nursing Shop 1 is an extension of the health assistant exploratory program. It deals with the study of direct care careers and community health careers. Beginning skills, shop safety and first aid, and communication skills are introduced in the shop 1 program. Students will become OSHA certified, obtaining the 10-hour Safety in Healthcare credential.

## **HEALTH ASSISTING/PRE-NURSING SHOP 2**

The Health Assisting/Pre-Nursing 10<sup>th</sup> grade shop is designed to build an awareness of the many dimensions of the healthcare field. Special emphasis is placed on developing professionalism, work ethics, and interpersonal skills. Concepts of growth and development, nutrition, infection control, OSHA, HIPAA, anatomy and physiology, and beginning Certified Nursing Assistant skills are introduced. Students have the opportunity to become certified in basic life support for healthcare providers. Clinical observation experiences may include the following: adult day care centers, nursing homes, and assisted living facilities,. English Language Arts is incorporated into the curriculum to enhance written communication and health documentation. Math skills are incorporated to strengthen the ability to do medical calculations. The primary goal is to develop an awareness of the roles and responsibilities of the health assistant as part of the health team, and to use this as a foundation of the healthcare ladder which will enable students to successfully continue on to 11<sup>th</sup> grade shop.

## **MEDICAL TERMINOLOGY**

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

## **HEALTH ASSISTING/PRE-NURSING SHOP 3**

The Health Assisting/Pre-Nursing 11<sup>th</sup> grade shop curriculum is designed to provide students with learning experiences that will prepare them to meet the nurse aide certification requirements. The students are given opportunities to obtain basic nursing aide skills, personal care skills and basic restorative services. Students are prepared to be tested by the American Red Cross both for their clinical skills and their knowledge of the requirements for the Commonwealth of Massachusetts Nursing Assistant Certification. Students will also have the opportunity to certify in the areas of homemaker/home health aide and Alzheimer's. . In addition, the Health Assisting curriculum includes Clinical Laboratory experiences offsite in an allied health clinical facility .

### **HEALTH ASSISTING/PRE-NURSING THEORY 3**

This course is focused on the aging process. Emphasis is placed on anatomy & physiology and the physical changes associated with health problems which require professional care. Other topics include communication skills, ethics, and problem solving methods. In addition, students will have the opportunity to obtain an in-house certification in Alzheimer's Care.

### **HEALTH ASSISTING/PRE-NURSING SHOP 4**

The Health Assisting/Pre-Nursing 12<sup>th</sup> grade shop is designed for those senior students who have successfully completed the Health Assisting/Pre-Nursing 11<sup>th</sup> grade shop. Students have the opportunity to become certified in basic life support for healthcare providers, first aid, , and medication assistants. In addition, students have the opportunity to explore the entry-level role of the pharmacy technician and patient care technician. The goal is to prepare a multi-disciplined health care worker who is cross trained for employment.

#### **Career Opportunities in Health Assisting/Pre-Nursing:**

##### **Entry Level Occupations**

Activities Assistant  
Geriatric Aide  
Nursing Assistant  
Rehabilitation Aide  
Rehabilitation Facility

Dietary Aide  
Home Health Care Aide  
Pharmacy Technician  
Teacher Aide in Pediatric  
Alzheimer's Caregiver

##### **With Experience and/or Advanced Training**

Central Supply Technician  
EKG Technician  
Medical Assistant  
Physical Therapy Aide

Dental Aide  
EMT/Paramedic  
Phlebotomist  
Respiratory Therapy Aide

##### **Related Occupations**

Dental Assistant  
Licensed Practical Nurse  
Medical Records Technician  
Professional Nurse (B.S.)  
Technical Nurse (A.D.)

Laboratory Technician  
Medical Assistant  
Medical Secretary  
Respiratory Technician  
X-Ray Technician

### **HEATING, VENTILATION, AIR CONDITIONING & REFRIGERATION EXPLORATORY**

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

### **HEATING, VENTILATION, AIR CONDITIONING & REFRIGERATION SHOP 1**

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

### **HEATING, VENTILATION/AIR CONDITIONING & REFRIGERATION SHOP 2**

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

### **HEATING, VENTILATION/AIR CONDITIONING & REFRIGERATION SHOP 3**

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

### **HEATING, VENTILATION, AIR CONDITIONING & REFRIGERATION THEORY 3**

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

### **HEATING, VENTILATION, AIR CONDITIONING & REFRIGERATION SHOP 4**

This course provides for continued hands-on experience with the HVAC&R trade areas by working with sheet metal component identification and installation, gas furnace troubleshooting and installation, air conditioning component installation and troubleshooting and proper maintenance and charging procedures for whole house air conditioning. Students also become familiar with measurement tools used in the HVAC&R industry, such as air flow meters, anemometers and psychrometrics. Troubleshooting and proper wiring techniques are also learned. The sixth edition of Refrigeration and Air Conditioning Technology, as well as Heating and Cooling Essentials text, will be used to support related and shop instruction.

### **HEATING, VENTILATION, AIR CONDITIONING & REFRIGERATION THEORY 4**

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

#### **Career Opportunities in Heating, Air Conditioning, and Refrigeration:**

##### **Entry Level Occupations**

Apprentice Refrigeration Technician  
Helper  
Parts Person  
Oil Burner Technician

Counter Person  
Limited Refrigeration Technician  
Salesperson  
Installers Apprentice

##### **With Experience and/or Advanced Training**

Applications Engineer  
Engineering Aid  
Foreman  
Licensed Refrigeration Contractor  
Mechanical Engineer  
Plant Engineer  
Supervisor Test Technician

Engineer Designer  
Estimator  
Layout Technician  
Licensed Refrigeration Technician  
Operating Engineer  
Sales Engineer  
Teacher

## **Related Occupations**

Installation Technician  
Salesperson

Maintenance Technician  
Service Technician

### **HOSPITALITY MANAGEMENT EXPLORATORY**

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

### **HOSPITALITY MANAGEMENT SHOP 2**

The hospitality industry is a diverse and global industry offering countless opportunities in lodging, restaurant operations, travel and tourism services, gaming and entertainment, and recreation management. The Hospitality Management Shop 2 provides sophomore students with a basic knowledge of the principles and fundamentals of the hospitality industry. Students are provided with a foundation in general customer service practices, management concepts and theories that form a basis for success in the Hotel, Travel & Tourism Service industries. Students concentrating in this program area are introduced to department functions and operational aspects within hotel departments utilizing the Hospitality Service text book and workbook. Students will gain real world experience in the school's Artisan Restaurant and function room focusing on dining room service skills. Student will have the opportunity to work in the fast paced environment of the School's Café. Students will also participate with the setup, service and breakdown of school functions and events. Students are trained and acquire basic technical skills in dining, banquets and customer service practices. Students will be able to participate in various industry tours, school functions, and volunteer opportunities. Student will demonstrate proper service etiquette, work ethic and professionalism to gain experience and build confidence. Students are able to experience on the job training working in a local hotel with the shop teacher.

### **HOSPITALITY MANAGEMENT SHOP 3**

The Hospitality Management Shop 3 course provides students with an intermediate knowledge of the principles and fundamentals of the hospitality industry. Students are provided with a foundation in specific customer service practices, hospitality soft skills and the theories that form a basis for success in the supervision of customer service. The Shop will utilize the lodging Management Program- Year One text and workbooks from The American Hotel and Lodging Educational Institute. Student will continue to focus on the refinement of basic skills with hands-on, individual training to connect classroom theory to real world practice. This technical program provides on the job experience working in a local hotel. Students will further develop their technical skills working in the following hotel departments; Front Desk, Human Resources, Restaurant, Kitchen, Banquets, Housekeeping, Laundry, Administration, Accounting and Engineering. Students will continue to develop confidence through this process and start focusing on the direction their career may take. Students will gain real world experience in our Artisan Restaurant and function room.

### **HOSPITALITY MANAGEMENT SHOP 4**

The Hospitality Management Shop 4 course will allow eligible students to participate in various Co-op work study programs with local hospitality businesses or continue to work in the local hotel. Students not eligible for co-op positions will continue to work in the local hotel narrowing their focus to specific career direction building on competency levels, confidence and employability. Students will further develop their technical skills working in the following hotel departments; Front Desk, Human Resources, Restaurant, Kitchen, Banquets, Housekeeping, Laundry, Administration, Accounting and Engineering. The Shop will utilize the lodging Management Program- Year Two text and workbooks from The American Hotel and Lodging Educational Institute. The coursework will

focus on leadership concepts, career development, operational leadership, and business management. Students are prepared for future employment or postsecondary education opportunities.

### **HOSPITALITY MANAGEMENT THEORY 3**

Theory 3 focuses on the organization and technical aspects of operating a successful lodging property with an emphasis on the front office and housekeeping. Students will analyze inventories, operational costs, payroll and labor costs, revenue, etc... while maintaining customer service and expectations through curriculum in Hospitality Services textbooks. Students will also analyze employment handbook policy and procedures to reinforce employability skills. Students are required to complete a career action plan to outline their career plans and the steps they need to take for the plans identified.

### **HOSPITALITY MANAGEMENT THEORY 4**

Theory 4 looks at the business behind the glamour with an introduction to business structures and management principles. Students will do projects on hotel franchises and cultural differences in the hospitality industry. An overview of support areas such as human resources, marketing, sales and accounting is explored. The legal and ethical considerations and practices of managing a lodging property will be reviewed. Students work on a business plan that encompasses the business knowledge gained. After completion of the business plan students work on a promotional campaign project sharpening each individual 21<sup>st</sup> century skills such as creativity and critical thinking.

#### **Entry Level Occupations:**

Front Desk Associate  
Breakfast Café Attendant  
Front Office Trainee  
Banquet Set-up Person

Dining Room Servers  
General Maintenance Staff  
Guestroom Attendant  
Event Planner Associate

#### **With Experience and/or Advanced Training:**

Front Office Supervisor/Manager  
Accounting Office Associate  
Catering Sales Manager  
Cafeteria Manager  
Host/Hostess  
Executive Housekeeper  
Hotel Manager  
Travel & Tourism Manager

Reservation Supervisor  
Banquet Sales Person  
Dining Room Supervisor/Manager  
Receptionist  
Food & Beverage Manager  
Maintenance Manager  
Restaurant Manager  
Hospitality Teacher

#### **Related Occupations:**

Cruise Ship Staff  
Bartender  
Food Service Manager  
Purser  
Apartment Building Superintendent

Flight Attendant  
Building Custodian  
Hospital Attendant  
Sales Manager  
Casinos

### **INFORMATION TECHNOLOGY SERVICES EXPLORATORY**

The Information Technology Services Exploratory introduces students to the aspects of the information technology and computer science fields. During the exploratory, students will learn how to develop websites, mobile apps and video games using state of the art software development tools. Students will also learn about the many different jobs opportunities and the many different career paths of IT. The students will develop websites that incorporate graphics, audio and video using the HTML and CSS languages. They will develop mobile apps for the iOS and Android platforms that will tested on iPhones/iPads and Android phones/tablets. Students will also develop 2d and

3d video games using an object-oriented game development engine called Unity and the programming language Visual C#.

### **INFORMATION TECHNOLOGY SERVICES SHOP 1**

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

### **ADVANCED PLACEMENT - COMPUTER SCIENCE PRINCIPLES**

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

### **INFORMATION TECHNOLOGY SERVICES SHOP 2**

The Information Technology Services 10<sup>th</sup> grade shop is designed to further develop student knowledge in the fields of programming and web development and their mastery in the skills of art, science and technology needed to develop, websites, mobile apps and video games. The curriculum continues to integrate the rigor and relevance of STEM (science, technology, engineering and mathematics) into fun and exciting classroom projects. Students will be focusing on developing the fundamental knowledge and use of HTML, CSS and JavaScript languages. Students will continue the development, uploading and installation of mobile apps on the iOS and Android platforms that will tested on iPhones/iPads and Android phones/tablets devices using app development tools. Student will be given the opportunity to develop 2D and 3D video games using an object-oriented game development engine called Unity and Visual C#. Students can also earn the opportunity to take several Microsoft Technology Associate and CIW Site Development Associate industry recognized technical certification exams.

### **INFORMATION TECHNOLOGY SERVICES THEORY 2 – INTRO COMPUTER TECHNICIAN COMPTIA A+ ESSENTIALS**

IT Essentials: PC Hardware and Software is a hands-on, career-oriented e-learning solution with an emphasis on practical experience to help students develop fundamental computer skills, along with essential career skills. The CompTIA Academy AND the All-In-One CompTIA A+ Certification curriculum helps students prepare for entry-level ICT career opportunities and the CompTIA A+ certification, which helps students differentiate themselves in the marketplace to advance their careers. In addition, the course provides a learning pathway to the CompTIA Network+ certification. IT Essentials: PC Hardware and Software can be delivered as an independent curriculum or integrated into a broader course of study, such as technology or continuing education programs. This course is instructor led and includes an online component with the expectation that students can complete assignments and assessments on and off campus.

## **AP COMPUTER SCIENCE A**

AP Computer Science A course introduces students to computer science with fundamental topics that include problem solving, design strategies and methodologies, organization of data (data structures), approaches to processing data (algorithms), analysis of potential solutions, and the ethical and social implications of computing. The course emphasizes both object and oriented and imperative problem solving and design. These techniques represent proven approaches for developing solutions that can scale up from small, dimple problems to large, complex problems

## **INFORMATION TECHNOLOGY SERVICES SHOP 3**

The Information Technology Services 11<sup>th</sup> grade shop is designed to further develop student knowledge in the fields of programming and web development attained from Information Technology Services Shop 2. Students will continue developing their competencies in planning and developing programs that apply the use of functions, methods and procedures. Students will apply the techniques of good GUI design techniques through procedural and object oriented programming structures in the development of their programs. Students will develop programs using Visual Basic and C#. Student will develop programs that include the use of arithmetic relational and logical operators, iterative and conditional looping, sort routines, file handling, and arrays. Students will do this through the development of structures, functions, objects, methods and classes. Students will work on their team, software testing and project management skills by developing a game and publishing a website to promote their game. Students will be introduced to Relational Database Management systems. Students will be introduced to the Linux operating system and basic scripting. Students will prepare for and get their OSHA 10 certification. Students will prepare for and take the Microsoft Technology Associates Software Development Fundamentals Certification Exam. Finally students will create a professional resume, work on job interview and employability skills in preparation for co-operative education opportunities.

## **INFORMATION TECHNOLOGY SERVICES THEORY 3- PC TECHNICIAN**

This course provides students with the knowledge to become industry certified as a PC technician, a major requirement of our current COOP employers. This course meets the specifications of two different industry certifications and VTE Frameworks Industry Recognized Credentials, and the CompTIA A+ certification. The course also introduces students to competencies required for SkillsUSA competition areas of Information Technology Services and Technical Computer Applications. This course will be taught through the combination of traditional hands on demonstration using real hardware and software, lecture, and the use of state of the art interactive virtual training using LabSim.

**INFORMATION TECHNOLOGY SERVICES SHOP 4**The Information Technology Services 12<sup>th</sup> grade shop continues to build on all competencies, skills and knowledge attained in 11<sup>th</sup> grade. Software Development introduces the elements of the software development process as practiced in industry. Students gain knowledge of how to identify and troubleshoot software problems, determine and document software system requirements, create and implement software designs, test and document software implementations, publish and maintain software, and manage software teams and projects. Students will create a capstone project that showcases all of the major concepts covered in programming, web development, and information technology and software development.

## **INFORMATION TECHNOLOGY SERVICES THEORY 4 - COMPUTER TECHNICIAN A+ ESSENTIALS**

Expanding upon what was learned in Programming & Web Development Theory 3- Computer Technician A+ Essentials, students will be provided with the knowledge to become industry certified as a PC technician, a major requirement of our current COOP employers. This course meets the specifications of two different industry certifications and VTE Frameworks Industry Recognized Credentials, and the CompTIA A+ certification. The course also introduces students to competencies required for SkillsUSA competition areas of Information

Technology Services and Technical Computer Applications. This course will be taught through the combination of traditional hands on demonstration using real hardware and software, lecture, and the use of state of the art interactive virtual training using uCertify labs.

### **Career Opportunities in Information Technology Services:**

#### **Entry Level Occupations**

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

#### **With Experience and/or Advanced Training**

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

#### **Related Occupations**

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

### **MARKETING EXPLORATORY**

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

### **MARKETING SHOP 1**

In the 4th Term, students choosing Marketing as their Shop will begin in Shop 1. This is designed to provide students who plan to enter this program with the basic skills and abilities necessary for success in the program. Students will be given the opportunity to progress at their own rate by use of competency based projects and methods of instruction. Students will have the opportunity to participate in a mentoring program with junior/senior level students in a variety of job-site situations in the Mall Stores. Hands-on learning activities in the Mall, as well as related instruction, will give each student an opportunity for self-expression through meaningful experiences. Computer applications will be utilized to design promotional flyers, create advertisements, and participate in a team advertising project. This project is designed for the student to obtain an understanding of the role of marketing in keeping up with industry standards.

### **MARKETING SHOP 2**

The Marketing Mall Stores provide each student with experiential learning activities which aid in the development of basic marketing and work ready skills. Each student is challenged to achieve acceptable performance at a rate that is consistent with their ability, interest and initiative. Competency-based learning materials provide activities that allow each student the opportunity to participate, and perform tasks that are appropriate to marketing

occupations. At this level, marketing studies and activities include: customer relations, retail, advertising, and financial analysis. Students will learn purchasing for resale, merchandising products, and inventory control systems using a point of service system. In addition, students learn the importance and are responsible for cash/credit control systems, cash/credit handling, and cash/credit management for the Marketing Mall Stores.

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

Current technology is integrated into the Marketing Shop II curriculum and is designed to enrich students' understanding and use of industry standard technologies used in the MS Office Suite – Word, Excel, PowerPoint and Adobe products for a series of projects that demonstrate knowledge of marketing information management. Skills will be taught and students will be industry ready. Students demonstrate management skills, financial literacy and spreadsheet development, document processing, along with electronic mail etiquette and messaging.

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

Topics such as Social Media, Brand Management, Sports and Entertainment Marketing, E-commerce, Digital Marketing, Database Management, and Advertising will be introduced.

### **MARKETING SHOP 3**

Junior students at the Shop 3 Level are ready to implement actual management experience in various areas of the 3 Mall Stores and CVS. This includes all aspects of Operations, Merchandising, and Displaying. In addition, the students work on curriculum called School Store Operations and the Functions of Marketing during their Junior year in Shop 3.

Juniors are responsible for the management and mentoring of Sophomore individuals within each department of the school stores. Their duties include Buying, Pricing, Receiving, Advertising, Sales, Displaying, and all Back Office Cash Reports, and Treasury Reports for the stores. Students also train on LogiVision, a computerized POS system that includes 4 computer POS terminals, and a back office terminal. LogiVision is a fully integrated, online retail management system that provides students with advanced technical training. The system includes Point of Sale, Inventory Control and General Ledger, Scanners, and barcode ticketing.

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

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

Students will work on a variety of real world projects that will prepare them for a career in the Marketing industry. Students will learn how to use social media and web-based job search sites, the importance of keywords, and develop an understanding of how to use local resources to grow their career. More advanced lessons on social media and computer based applications will be applied to class projects.

Students will utilize Social Media, Brand Management, Sports and Entertainment Marketing, E-commerce, Digital Marketing, Database Management, and Advertising will be introduced

### **MARKETING THEORY 3**

Marketing Education Theory 3 will consist of two parts, Accounting will be taught over 2 terms and Website Marketing taught over 2 terms. In Accounting, students will learn the process of planning, recording, analyzing, and interpreting financial information. Throughout the course, students will learn how to keep financial records for a service company. Students will conduct a series of accounting activities including recording financial information for this service company. This course will prepare students to understand the purpose of the accounting system and demonstrate an understanding of the accounting equation. Students analyze transactions into debit and credit parts. Students will record transactions into a general journal, and then post the journal entries to a general ledger. Students will also do project related activities, such as analyzing public companies' financial statements, the importance of business ethics and code of conduct, and relate the accounting concepts to the marketing mall shops.

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

### **MARKETING SHOP 4**

The Marketing Education Cooperative Education Program is most important at this level. The Cooperative Education Placement Program provides students with an exciting opportunity to expand their educational knowledge and experience in a real work environment that directly relates to their career goals. Students gain valuable employability experience while furthering their understanding of their occupational field within a structured, supervised environment.

Students not participating in a co-op experience will focus on personal development, job readiness, and continue to prepare themselves for the world of work in a marketing and business environment. Students will continue to develop their consumer math skills for finance and business. Applied learning strategies are emphasized to demonstrate transferable skills, changing work skills, and the impact technology has on their career. The Shop instructor will continue to work with all students to assist the student in a Co-op placement.

### **MARKETING THEORY 4 – BUSINESS PLAN & ENTREPRENEURSHIP**

This senior year course focuses on the development of future entrepreneurs. This course concentrates on the skills, characteristics and knowledge necessary to be a successful entrepreneur. Students will enhance their knowledge from previous course knowledge, such as accounting, business operations, digital and social media marketing, advertising, customer service, marketing research, marketing shop and co-op experience to create and develop a business plan. The business plan will consist of the following: Identifying a business opportunity, developing a business description, conduct market research, create a marketing plan, organizational structure plan, financial plan, and projected financial and investment data. Students will learn how to prepare proposed financial statements, such as balance sheets and income statements. In addition, students will learn how to identify business and market needs; product distribution, business and product promotion and selling; different types of ownership structures, selecting a business location; planning and tracking business finances; human resource management; risk

management and best practices in business management. The students will also do project based activities on researching, analyzing and focusing on successful entrepreneurs and companies.

### **Career Opportunities in Marketing Education Entry Level Occupations**

Advertising & Publication professional  
Bank Teller  
Customer Service Representative  
Marketing Assistant  
Public Relations Assistant  
Visual Merchandiser Assistant

Assistant Buyer  
Cashier  
Insurance Sales Representative  
Marketing Research Assistant  
Retail Sales / Management  
Wholesale & Manufacturers Representatives

### **With Experience and/or Advanced Training**

Accountant  
Advertising/Display Manager  
Assistant Buyer  
Business Development  
Cash Office Manager  
Digital and Social Media Marketer  
Event Coordinator and Planner  
E-Commerce Representative  
Exhibits and Promotions Manager  
Marketing Researcher  
Merchandise Manager  
Product Marketer  
Search Marketing (Google)  
Store Manager  
Training Director

Account Representative  
Advertising Sales Representative  
Assistant Manager  
Buyer  
Customer Service Representative  
Email Marketer  
Event and Trade Show Marketing  
Entrepreneur  
Management Trainee  
Marketing Education Teacher  
Operations Manager  
Purchasing Agent  
Social Media Specialist  
Store Owner

### **Related Occupation**

Accountant  
Advertising/Display Manager  
Assistant Buyer  
Brand Marketing  
Construction Marketing  
Department Manager  
Financial Services Marketing  
Health Products & Service Marketing  
International Marketing  
Online Advertising and Marketing  
Pricing Analyst and Specialist  
Marketing Communications  
Real Estate Marketing  
Public Relations  
Sports and Entertainment Marketing

Account Representative  
Advertising Sales Representative  
Assistant Manager  
Communication Manager  
Customer Service Representative  
Fashion Marketing  
Food Products Marketing  
Insurance Marketing  
Internet Marketing  
Paid Search Manager  
Manufacturer's Sales Representative  
Media Planner (TV, Radio, Films, Online)  
Recreation & Hospitality Marketing  
Retail Marketing Operations  
Tourism & Travel Marketing

### **MASONRY EXPLORATORY**

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

## **MASONRY SHOP 1**

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

## **MASONRY SHOP 2**

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

## **MASONRY SHOP 3**

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

## **MASONRY THEORY 3**

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

## **MASONRY SHOP 4**

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

## **MASONRY THEORY 4**

The theory 4 course emphasizes the principles and theory of concrete formwork, design and construction of footings and foundations; columns, beams and lintel design and chimney design, fireplace design and construction, brick walls and partitions (buttresses, pilasters, arches, refractory brick). Maintenance, repair, improvement, and computer estimating are also studied in this course.

### **Career Opportunities in Masonry:**

#### **Entry Level Occupations**

Apprentice Bricklayer

Apprentice Materials Handler/Tender

Apprentice Cement Finisher

Apprentice Stonemason

#### **With Experience and/or Advanced Training**

Building Inspector

Masonry Contractor

Cement Mason

Tile Setter

Plasterer

General Contractor

Journeyman Bricklayer Stonemason/

Project Estimator

Pipe Coverer

Teacher

#### **Related Occupations**

Concrete Form Installer

Masonry Store Clerk

## **MEDICAL LABORATORY AND ASSISTING EXPLORATORY**

This course introduces the student to career opportunities in the medical assistant field. Medical assistants work with physicians in offices, hospitals and clinics. Students are made aware of the many skills required of medical assistants, including office management skills, performing routine tests, vital signs, preparing patients for examinations, health education and a host of others. Basic first aid will be demonstrated and therapeutic communication will be emphasized. Student will have the opportunity to experience laboratory procedures

including lab reporting. A wide variety of teaching techniques are used to stimulate student curiosity about this interesting health career.

### **MEDICAL LABORATORY AND ASSISTING SHOP 1**

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

### **MEDICAL LABORATORY & ASSISTING SHOP 2**

The Medical Laboratory & Assisting 10<sup>th</sup> grade shop introduces the students to the role of the Medical Assistant in a medical practice, hospital, or outpatient setting. The clinical procedures and techniques will include taking a patient medical history, performance of: medical asepsis, sterile technique, vital signs, audiology, visual acuity testing, documentation, and patient education. Students will practice assisting with physical exams and specialty procedures such as: minor surgical procedures, obstetrics and gynecology, pediatric exam, and rehabilitative medical procedures. Use of specialty medical equipment including the autoclave, ultrasonic cleaner, surgical instruments, audiometer, Titmus vision screener, spirometer as well as the nebulizer will be experienced. Special emphasis is placed on developing professionalism, work ethics, interpersonal skills and effective communication. Concepts of growth and development, infection control, OSHA, HIPAA, anatomy and physiology, and basic disease pathology.

### **MEDICAL TERMINOLOGY**

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

### **MEDICAL OFFICE MANAGEMENT 1**

This course is an introduction to the administrative procedures and skills necessary to operate a basic medical office practice. The medical office procedures will include telephone and reception techniques, appointment scheduling, interpersonal communication, records management, written correspondence and basic bookkeeping skills. The various types of medical insurance will be introduced. The office environment is also studied. Students will learn about the personal characteristics and professionalism involved in being a successful medical assistant, as well as their ethical and legal responsibilities.

### **MEDICAL LABORATORY & ASSISTING SHOP 3**

The Medical Laboratory & Assisting 11<sup>th</sup> grade shop introduces the student to the practical application of clinical laboratory procedures, dosage calculation and medication administration, and basic nutrition. Students will be instructed in laboratory safety, aseptic technique, patient safety including the CLIA law, and the proper use of universal precautions. Emphasis will be placed on the incorporation of realistic clinic situations and critical thinking skills. The student will be expected to employ the skills they have learned in varied situations. Instruction will include the capillary finger stick procedure which requires that all students be clinically certified before being allowed to puncture independently. Simple to complex procedures will include: hematocrit, hemoglobin, glucose, ABO blood typing, WBC differentiation, simple tissue stains and the Gram stain technique. Students will be introduced to microscopy, as it relates to the observation of blood cells and bacteria. Each procedure learned will include the clinical relevance of the test, the appropriate documentation, and basic interpretation of the laboratory results. Students will be introduced to phlebotomy using venipuncture training arms. This training will include

the correct tubes and additives used for each laboratory test. In addition, emphasis will be placed upon clinical technique, specimen handling, labeling, charting, and professionalism. Each student must also complete a 10-hour OSHA certification course which is required for cooperative education. Students

### **MEDICAL LABORATORY & ASSISTING THEORY 3**

This course offers a strong theoretical framework to accompany the Medical Assisting Shop 3 curriculum. Students will explore the disease processes and rationale for the procedures they are learning. Students will also begin the Pharmacy Technician Certification Board program. In the role of the pharmacy technician they are able to work more effectively with pharmacists to offer better patient care and service. After completion of the program during the senior year students will be given the opportunity to take the PTCE- Pharmacy Tech Certification Exam and become a Nationally Certified Pharmacy Technician. Emphasis will be placed on critical thinking skills.

### **MEDICAL LABORATORY & ASSISTING SHOP 4**

The Medical Laboratory & Assisting 12<sup>th</sup> grade shop is designed to further develop student knowledge in the art and science of Medical Laboratory & Assisting. Students have the opportunity to become certified in Basic Life Support for healthcare providers and First Aid. Students will practice their clinical skills including but not limited to vital signs, ECG, sterile technique, and specialty examination procedures. Emphasis is placed on team building, leadership development and project based learning.

### **MEDICAL LABORATORY & ASSISTING THEORY 4**

This course focuses on the theory and procedures of electro-cardiology leading to the National Healthcare Association Certified Electro-Cardiograph Tech (CET Tech) Exam. Additional areas of study include resume writing, job interview skills, and first aid/CPR. Students will also complete the Pharmacy Technician Certification Board program. The remainder of the year will focus on the review of theory and clinical skills necessary to sit for the National Healthcare Association CCMA Exam.

#### **Career Opportunities in Medical Laboratory & Assisting:**

##### **Careers as a Medical Assistant**

Administrative Medical Assistant  
Records Management Clerk  
Medical Office Manager  
Medical Lab Assistant/Technologist  
Blood Bank Technician  
Specimen Processing Technician

Clinical Medical Assistant  
Phlebotomy Technician  
Certified Medical Assistant (in  
specialty areas i.e., Pediatrics)  
Ophthalmology, Internal Medicine

##### **With Experience and/or Advanced Training**

Central Supply Technician  
EKG Technician  
Physical Therapy Aide

Dental Aide  
EMT/Paramedic  
Respiratory Therapy Aide

##### **Related Occupations**

Laboratory Technician  
Medical Assistant  
Respiratory Technician

Licensed Practical Nurse  
Professional Nurse (B.S.)  
Technical Nurse (A.D.)

### **METAL FABRICATION & JOINING TECHNOLOGIES EXPLORATORY**

The primary purpose of this program is to expose ninth grade students to the equipment, power machinery, hand tools and welding joining processes of the metal fabrication trade. This course covers the safe use of equipment in both forming and welding metals. Included are small projects that are fabricated and welded in the shop

environment. Students will also receive hands-on basic skills in gas metal arc welding. This course is designed to give the students an overview of this trade in assisting them to make a decision for their major area of study.

### **METAL FABRICATION & JOINING TECHNOLOGIES SHOP 1**

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

### **METAL FABRICATION & JOINING TECHNOLOGIES SHOP 2**

This course enables students to perform metal layout and fabrication of both sheet metal and structural metal projects. Additionally, they will be able to join metals with various welding equipment such as oxy-fuel, ARC welding and MIG welding processes. They will safely perform work with both hand tools and power equipment to both shape and form metals.

### **METAL FABRICATION & JOINING TECHNOLOGIES SHOP 3**

This program enables the student to advance in the field of metal fabrication using different types of welding techniques for joining metals, both ferrous and nonferrous. Students will further develop their skills using power forming machines in the fabrication of shop projects. There is an emphasis on print reading and layout methods for both sheet stock and structural materials.

### **METAL FABRICATION & JOINING TECHNOLOGIES THEORY 3**

This program introduces students to the career field of metal fabrication. Emphasis is placed on safety, tool recognition, machinery and their capacities to assist the fabricator. Math, measuring and blueprint reading used in the manufacture of sheet stock and structure materials are stressed. Classroom projects and homework assignments are used to further the students understanding of their potential to become a quality craftsman.

### **METAL FABRICATION & JOINING TECHNOLOGIES SHOP 4**

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

### **METAL FABRICATION & JOINING TECHNOLOGIES THEORY 4**

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

#### **Career Opportunities in Metal Fabrication:**

##### **Entry Level Occupations**

Apprentice Fabricator  
Tungsten Inert Gas Welder  
Oxy. Acet. Welder and Cutter  
Punch Press Operator  
Sheet Metal Worker Apprentice

Arc Welder (all phases)  
Iron Worker  
Press Brake Operator  
Shear Operator  
Supervisor

##### **With Experience and/or Advanced Training**

Factory Representative  
Fabrication Teacher

Heating & Ventilating Air Conditioning Spec. Metal  
Precision Sheet Metal Inspector

Precision Sheet Metal Model Maker  
Shop Owner  
Welding Inspector

Project Estimator  
Welding Engineer

#### **Related Occupations**

Drill Press Operator  
Grinder  
Spot Welder  
Welding Supply Delivery Person

Factory Benchhand  
Salvage Yard Person  
Stock Handler  
Welding Supply Store Clerk

### **PAINTING & DESIGN EXPLORATORY**

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

### **PAINTING & DESIGN SHOP 1**

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

### **PAINTING & DESIGN SHOP 2**

The students learn to use various painting techniques. Students now become familiar with staining, matching paint, color theory and paint failures. Students will become knowledgeable in the safe use of a variety of tools. Students are trained on the use of these tools and equipment to produce a finished product of high quality. Students will also develop skills in the area of cost and material estimation.

### **PAINTING & DESIGN SHOP 3**

The shop 3 students are given more in-depth experience in the painting and design trade. They are exposed to complicated techniques, which require greater skill and craftsmanship, such as the setting up of staging, troubleshooting paint failures and selecting their remedies. Students will learn many faux finishing techniques and apply them to various surfaces. Students now prepare estimates, overhead expenses, surface identification and preparation. They are also exposed to various types of wall coverings and their applications. Students will have the opportunity to work on "off-campus projects" and to develop their skills further as they do real job applications. Students will be a part of the Construction Cluster House Building project. The *Wheels of Learning* program will be used to support the theory program with hands-on activities that correlate to the modules. Within the first semester of this program, students will have the opportunity to successfully train and receive their OSHA 10-hour card.

### **PAINTING & DESIGN THEORY 3**

This course further develops students' knowledge about the elements of painting and design. Student instruction will include, but is not limited to, paints and coatings, wallcovering, decorative finishes, furniture styles, spray painting, floor plans, textiles and color theory. Students will create resumes and job portfolios in preparation for employment through our Cooperative education program. Cooperative education placements are available in the

3<sup>rd</sup> quarter to 11<sup>th</sup> grade students who meet the school's criteria. Curriculum is based on a variety of trade books including, *the Wheels of Learning* and *Painting & Decorating Skills and Techniques*. In addition, safety is addressed in all units. Reading, writing and math assignments related to the painting & design industry are an important part of this course.

#### **PAINTING & DESIGN SHOP 4**

This last year is used to develop speed, accuracy and a greater understanding of the trade as applied to basic business practices, preparing job estimates, figuring material and labor costs, time allotments for certain jobs, etc. Students are allowed to work more independently within the shop and around the school and are given more responsibility such as assisting underclass mates with their duties. Various types of spray painting, such as conventional, airless and HVLP, will be used throughout the school year. As students expand their expertise in the painting and design trade and improve the quality of their work, they will increase the potential opportunities for higher wages and greater chances of employment in the many areas of the painting field. Co-operative education is available to 12<sup>th</sup> grade students who meet the school's criteria, as students put their training to use in the workplace.

#### **PAINTING & DESIGN THEORY 4**

In this course, students will become proficient in their technical knowledge of painting & design technologies. Students will create their own interior design board showcasing a collection of materials, drawings, inspiration, sketches, and finishes, to present their design idea visually. Curriculum is based on a variety of trade books including *Housing and Interior Design as well as The Wheels of Learning*. In addition, students will continue to build upon their resumes and job portfolios in preparation for employment through our Cooperative education program, as well as, employment after graduation. Cooperative education placements are available to 12<sup>th</sup> grade students who meet the school's criteria, as students put their training to use in the workplace. Finally, students will also learn about colleges and universities with Painting or Interior Design programs as they prepare for a successful career.

#### **Career Opportunities in Painting & Design:**

##### **Entry Level Occupations**

Apprentice Painter	Construction Painter
Drywall Finisher	Faux Finisher
Furniture Finisher	House Painter (Interior & Exterior)
Paint & Wallpaper Salesperson	

##### **With Experience and/or Advanced Training**

Art Gilder	Electrostatic Painter
Industrial Sprayer	Interior Designer
Military Painter	Mural Artist Painter
Painting Contractor	Physical Plant Paint Foreman
Powder Coater	Set Design
Union Painter	

##### **Related Occupations for Painting & Design**

Estimator	Lead Paint Inspector
Facilities Management	Sales Representatives for Paint Manufactures
Trade Shop Set-Up	

#### **PLUMBING EXPLORATORY**

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

## **PLUMBING SHOP 1**

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

## **PLUMBING SHOP 2**

At this level, the students fabricate projects in all the materials used for water distribution, waste water, venting and gas projects. They also work on material identification, sizes, selection of tools, and their uses. Shop safety is strongly emphasized at all times during this course.

## **PLUMBING SHOP 3**

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

## **PLUMBING THEORY 3 (TIER 1)**

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

## **PLUMBING SHOP 4**

Students at this level review the basics and then, with emphasis on safety, proceed with projects that will expand their skill in working with all types of pipes and fittings, fixtures, faucets, hot water heaters, tankless heaters, and gas appliances. All types of power and hand tools and various tricks of the trade are introduced. If sufficient opportunities exist and the students are eligible, seniors are encouraged to participate in the co-op work program. During this program, the student works in the field for a master plumber on his/her shop week, thereby gaining valuable, on-the-job experience. Most co-op jobs result in full-time employment opportunities upon graduation.

## **PLUMBING THEORY 4 (TIER 2)**

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

### **Career Opportunities in Plumbing:**

#### **Entry Level Occupations**

Apprentice Gasfitter/License  
Plumbing Supply Clerk

Apprentice Plumber/License  
Stock Clerk

#### **With Experience and/or Advanced Training**

Designer-Plumber  
Journeyman Gasfitter/License  
Master Plumber  
Plumbing Contractor

Foreman  
Journeyman Plumber/License  
Mechanical Engineer  
Plumbing Estimator

Plumbing Inspector  
Purchasing Agent  
Teacher

Building Maintenance Person  
Hydraulic/Pneumatic Technician  
Pricing Clerk

Project Supervisor  
Sanitary Engineer  
Trade Guide Office

**Related Occupations**

Gas Company Worker  
Pipefitter  
Sprinkler Fitter

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# ACADEMIC COURSE DESCRIPTIONS

## ENGLISH LANGUAGE ARTS

### **ENGLISH 1 - Honors**

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

### **ENGLISH 1 - CP**

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

### **ENGLISH 2 - Honors**

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

### **ENGLISH 2 - CP**

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

### **ENGLISH 3 - AP ENGLISH LANGUAGE AND COMPOSITION**

The AP English Language and Composition course aligns to an introductory college-level rhetoric and writing curriculum, which requires students to develop evidence-based analytic and argumentative essays that proceed

through several stages of drafts. Students evaluate, synthesize, and cite research to support their arguments. Throughout the course, students develop a personal style by making appropriate grammatical choices. Additionally, students read and analyze the rhetorical elements and their effects in non-fiction texts, including graphic images as forms of text, from many disciplines and historical periods. Teacher recommendation is required for this course.

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

### **ENGLISH 3 - Honors**

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

### **ENGLISH 3 - CP**

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

### **ENGLISH 4 – AP ENGLISH LITERATURE AND COMPOSITION**

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

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

### **ENGLISH COMPOSITION 1 – DUAL ENROLLMENT**

The course will provide three (3) credits at Middlesex Community College. English Composition I includes prewriting, writing, and revising essays of exploration, analysis, argumentation/persuasion, and research. Students write at least three papers of three-five pages in length and one position paper of five-ten pages that requires a thesis and support developed through formal research and documentation. This course emphasizes reading of literature and informal writing as methods through which ideas are developed. Students must receive a 70 or better

to receive college credit. Students will be responsible for the Middlesex Community College tuition to receive credits.

**Prerequisites** Middlesex Community College requires students to submit a Multiple Measures sheet which includes the following criteria; a minimum of a 2.0 GPA; a minimum PSAT Reading score of 480; and junior teacher recommendation.

### **ENGLISH 4 - Honors**

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

### **ENGLISH 4 - CP**

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

## **MATHEMATICS**

### **ALGEBRA 1 - HONORS**

This course is designed to give the students the fundamentals skills necessary to succeed in Algebra 1-CP and provide assistance to specific learning needs. It will cover expressions and variables, real number properties, solving and graphing equations. Throughout the course, students will learn how to solve real-world and mathematical problems. Algebra 1 is aligned with the Massachusetts Common Core Curriculum.

### **ALGEBRA 1 - CP**

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

### **PRE-ALGEBRA**

This course is designed to give the students the fundamentals skills necessary to succeed in Algebra 1-CP. It will cover expressions and variables, real number properties, solving and graphing equations. Throughout the course, students will learn how to solve real-world and mathematical problems. Pre-Algebra CP is aligned with the Massachusetts Common Core Curriculum.

### **ALGEBRA 1 - CP ENHANCED / EXTENDED**

This course is aligned with the Massachusetts Common Core Curriculum. It is designed to give the students the fundamental skills necessary to succeed in Algebra 1 - CP and provide assistance to specific learning needs. It will cover expressions and variables, real number properties, and solving and graphing equations before beginning the Algebra 1-CP curriculum which will focus on the development of essential math skills. Students will also

cover inequalities, equation solving, real number properties, polynomials and slope intercept. In all areas word problems are stressed. Homework is a requirement.

### **GEOMETRY - HONORS**

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

### **GEOMETRY - CP**

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

### **ALGEBRA 2 - HONORS**

This course covers Algebra 2 topics including terminology, transformations, and operations on functions, rational functions, exponential and logarithmic functions, arithmetic and geometric sequences and series, and right triangle trigonometry and applications. Students must supply their own scientific calculator (TI-30 recommended) or graphing calculator (TI-84 recommended).

### **ALGEBRA 2 - CP**

Students will investigate arithmetic and geometric sequences, and multiple function types including linear, quadratic and exponential functions. Additional topics of study include exponents and irrational numbers. Algebra 2 is aligned with the Massachusetts Math Curriculum frameworks.

### **FUNCTIONS AND NUMBER SYSTEMS**

Functions and Number Systems strengthens baseline algebraic skills to transition from Algebra 1 to Algebra 2 with a focus on linear, quadratic, and exponential functions and number systems. Students will learn how to identify, graph, and compare and contrast each type of function. Real-life models and situations will be investigated to solidify understanding of all three function types.

### **AP CALCULUS AB**

This course addresses all of the topics in Calculus Honors as well as inverse trigonometric functions, differential equations, and slope fields. The course is intended to be the equivalent of a one-semester, college-level calculus course, which is taught over a full year in high school. This course culminates with the advanced placement exam that can earn college credit for the student. Students must supply their own graphing calculator (TI-83 or TI-84 recommended). Recommendation is required for this course.

### **CALCULUS - HONORS**

This course addresses Calculus AB topics including limits, derivatives of elementary functions, partial fractions, integrals of elementary functions, and applications of differentiation and integration. Students must supply their own scientific calculator (TI-30 recommended) or graphing calculator (TI-84 recommended).

### **PRE-CALCULUS – HONORS**

This course covers Pre-Calculus topics including triangle, circular and analytic trigonometry, exponential and logarithmic functions and equations, vector analysis, systems of equations and inequalities, matrix algebra, mathematical induction and probability, and analytic geometry. Students must supply their own scientific calculator (TI-30 recommended) or graphing calculator (TI-84 recommended).

## **PRE-CALCULUS – CP**

This course is offered to students who have completed Algebra II CP or higher and who are recommended by their Algebra II CP teacher. Pre-calculus prepares students for a study of Calculus, covering trigonometry, exponential and logarithmic functions and equations, vector analysis, systems of equations, matrix algebra, and conics.

## **PROBABILITY AND STATISTICS – CP:**

This course begins with a study of probability, with a focus on conceptual understanding. Students then move into an exploration of sampling and comparing populations. The first semester closes with units on data distributions and data analysis—including how to summarize data sets with a variety of statistics. In the second half of the course, students create and analyze scatterplots and begin a basic study of regression. Then they study two-way tables and normal distributions, learning about powerful applications such as hypothesis testing. Finally, students return to probability at a more advanced level, focusing on topics such as conditional probability, combinations and permutations, and sets. Successful completion of Algebra 2 or above is a pre-requisite for this course.

## **PROBABILITY AND STATISTICS – HONORS**

This course begins with an in-depth study of probability, with a focus on conceptual understanding. Students then move into an exploration of sampling and comparing populations. The first semester closes with units on data distributions and data analysis—including how to summarize data sets with a variety of statistics. In the second half of the course, students create and analyze scatterplots and begin a basic study of regression. Then they study two-way tables and normal distributions, learning about powerful applications such as hypothesis testing. Finally, students return to probability at a more advanced level, focusing on topics such as conditional probability, combinations and permutations, and sets. This course includes independent assignments and projects. It requires completion of Algebra II CP or higher and a recommendation by the student's Algebra II CP teacher.

## **ALGEBRA 2 / PROBABILITY AND STATISTICS APPLICATIONS**

This course contains two major content areas. The algebra 2 section applies the concepts and methods of algebra to important competencies needed for business, industry, and personal success. Topics studied include linear, quadratic, and exponential functions and right triangle trigonometry. This course is designed to enable students to increase their levels of math proficiency as described in the Massachusetts Frameworks for Mathematics. The probability and statistics portion of the course begins with an in-depth study of probability with a focus on conceptual understanding. This includes the difference between theoretical probability and experimental outcomes. Students move to sampling and comparing populations and express the likelihood of single and multiple events numerically. The content area closes with units on data distributions and data analysis—including how to summarize data sets with a variety of statistics.

# **PHYSICAL EDUCATION/WELLNESS**

## **PHYSICAL EDUCATION 9<sup>TH</sup>/ WELLNESS**

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

## **TEEN HEALTH**

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

curriculum includes classroom activities and discussions, as well as guest speakers from local community organizations.

### **PHYSICAL EDUCATION 10<sup>th</sup>/WELLNESS**

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

### **PHYSICAL EDUCATION UPPER 1/WELLNESS**

Carryover activities from PE 9<sup>th</sup> make up the senior/junior curriculum. Activities include tennis, racquetball, volleyball, softball, floor hockey, jogging/walking, badminton, ping pong, fitness machines and weights, pickleball, golf, and aquatics.

### **PHYSICAL EDUCATION UPPER 2/WELLNESS**

Carryover activities from PE 9<sup>th</sup> make up the senior/junior curriculum. Activities include tennis, racquetball, volleyball, softball, floor hockey, jogging/walking, badminton, ping pong, fitness machines and weights, pickleball, golf, and aquatics.

### **UPPER HEALTH 1**

This course continues, and furthers, the curriculum of Teen Health from the 9th grade year. As with Teen Health, the primary focus is on overall wellness in the physical, mental/emotional, and social categories of health. Issues such as decision making, self-esteem, peer pressure, bullying, nutrition, fitness, smoking, alcohol, drugs, sexually transmitted infections, healthy relationships, and human sexuality are covered in this course. Emphasis is placed on decision making and choices resulting in a high quality of life. The curriculum includes classroom activities and discussions, as well as guest speakers from local community organizations.

### **UPPER HEALTH 2**

This course continues, and furthers, the curriculum of Teen Health from the 9th grade year. As with Teen Health, the primary focus is on overall wellness in the physical, mental/emotional, and social categories of health. Issues such as decision making, self-esteem, peer pressure, bullying, nutrition, fitness, smoking, alcohol, drugs, sexually transmitted infections, healthy relationships, and human sexuality are covered in this course. Emphasis is placed on decision making and choices resulting in a high quality of life. The curriculum includes classroom activities and discussions, as well as guest speakers from local community organizations.

### **ADAPTIVE PHYSICAL EDUCATION/WELLNESS**

Adapted physical education is a program consisting of developmental fitness activities, games, and sports (, whiffle ball, golf, volleyball, swimming, shuffleboard, bowling, kickball, badminton, weight training, nerf soccer, basketball) designed for students who may not be able to successfully participate in a regular physical education program and need adaptations.

## **SCIENCE**

### **BIOLOGY - HONORS**

This one-year course increases the student's awareness of the living world. Major concepts such as cell structure and organization, metabolism, growth, reproduction, biochemistry, genetics, taxonomy, evolution and ecology, are emphasized. Laboratory investigations teach important biological techniques and reinforce major

concepts. Students enrolled in Honors Biology are expected to take the biology MCAS at the end of the course. This course has been aligned with the Massachusetts Science Curriculum Frameworks.

### **BIOLOGY 1 - CP**

Biology 1 is the first part of a two-year course. This course provides a concept-based overview of biological principles. Topics include the chemistry of life, cell structure, functions and processes, genetics, classification, evolution, biodiversity, human anatomy and physiology. The goal of this course is that students will make meaningful connections to the curriculum and gain a general understanding of the basic biology concepts through laboratory experiments, group activities, interactive technology activities, projects and classroom work. This course has been aligned with the Massachusetts Curriculum Frameworks.

### **BIOLOGY 2 - CP**

Biology 2 is the second part of a two-year course. This course provides a comprehensive coverage of biological principles and their application to real living organisms. Topics include the chemistry of life, cell structure, functions and processes, genetics, classification, evolution, biodiversity, human anatomy and physiology. The objective is that the students will gain a solid understanding of how living things function and interact with their environment. This will be done through laboratory experiments, group activities, interactive technology activities, projects and classroom work. This course has been aligned with the Massachusetts Curriculum Frameworks. Laboratory work is an important part of this course.

### **GENERAL CHEMISTRY HYBRID/LAB 1 – DUAL ENROLLMENT**

A study of the fundamental chemical laws and theories. Topics include atomic and molecular structure or matter, stoichiometry, periodicity, chemical bonding, chemical and physical properties of matter, and change of state. Laboratory work is an important part of this course. This is a dual enrollment course with a Quincy College.

### **AP ENVIRONMENTAL SCIENCE**

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

### **ENVIRONMENTALS SCIENCE – CP**

Environmental science is a captivating and rapidly expanding field, and this two-semester course offers compelling lessons that cover many aspects of the field: ecology, the biosphere, land, forests and soil, water, energy and resources, and societies and policy. Through unique activities and material, high school students connect scientific theory and concepts to current, real-world dilemmas, providing them with opportunities for mastery in each of the segments throughout the year. Laboratory work is an important part of this course.

### **AP BIOLOGY**

AP Biology is an introductory college-level biology course. Students cultivate their understanding of biology through inquiry-and laboratory-based investigations as they explore the following topics: evolution, cellular processes — energy and communication, genetics, information transfer, ecology, and interactions. The course is based on four Big Ideas, which encompass core scientific principles, theories, and processes that cut across traditional boundaries and provide a broad way of thinking about living organisms and biological systems. The course is intended to be the equivalent of a two-semester, college-level biology course, which is taught over a full year in high school. Recommendation is required for this course.

## **CHEMISTRY - HONORS**

This course is designed for students who have successfully completed Biology and Algebra 1- honors level. Detailed investigations require independent inquiry and problem-solving along with communication of findings. Topics include periodic table, types of reactions, nuclear chemistry, stoichiometry, gas laws and acid-base reactions. This course is aligned with the Massachusetts Curriculum Frameworks. Laboratory work is an important part of this course.

## **CHEMISTRY - CP**

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

## **ANATOMY & PHYSIOLOGY - HONORS**

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

## **PHYSICS - HONORS**

Physics is the study of how things work. Concepts are developed in a style that will allow students to relate physics to the real world. The course involves hands-on learning experiences, where students will be required to collect, analyze and draw conclusions from derived data. Science skills and physics concepts are integrated with mathematics and technology. Topics covered include speed, acceleration, gravity, momentum, centripetal force, heat, thermal energy, waves, sound, light, electricity, magnetism and electromagnetism. Logical and deductive thinking, problem solving and application are emphasized. Laboratory work is an important part of this course.

## **ANATOMY & PHYSIOLOGY - CP**

This course consists of an in-depth and concentrated study of the structural and functional levels of organization of the human body. Through lectures, videos, experiments and computer use, each curriculum unit covers a separate system of the body and how each system relates to the body as a whole. Dissection of a sheep heart and brain are part of the standard laboratory experience for this course; alternative activities are available upon written request in lieu of dissections by parent/guardian. Laboratory work is an important part of this course.

## **BIOTECHNOLOGY 1 - CP**

In this elective course students will explore the fundamental principles, career pathways and business applications used in the medical, pharmaceutical, and agricultural industries. Topics covered in this class could include DNA, RNA, and protein technologies; medical diagnostics; the healthcare and pharmaceutical industries and food chemistry. A strong emphasis will be placed on laboratory technique and the scientific process. This is a multi-level hands-on, lab intensive science course. There are no prerequisites for this course. Laboratory work is an important part of this course.

## **PHYSICS - CP**

This course is required for students who are enrolled in industry-based vocational programs. Students in any other vocational programs can also enroll. The focus of this course is two-fold: the investigation of a variety of physics topics and the development of skills in experimentation and problem solving. Topics include speed, acceleration, gravity, momentum, centripetal force, motion of the planets, heat, states of matter, sound, light, electricity,

magnetism, radioactivity and nuclear reactions. Emphasis is placed on logical thinking, problem solving, and the use of basic algebra skills. Laboratory work is an important part of this course.

### **APPLICATIONS OF SCIENCE - CP (3 credits)**

This course will focus on the fundamentals of science and their impact on the technological world. This course will provide students the opportunity to conduct independent research on significant contemporary scientific issues. During their research students will learn how to identify and use reliable internet resources, utilize Google docs, incorporate web-based templates, and present work through an online platform. Research topics include vaccinations, viruses, bacteria, food industry, ethical treatment of animals, and personal and global impact of scientific discoveries of today and tomorrow. Laboratory work is an important part of this course.

### **ENGINEERING SCIENCE – CP (3 credits)**

This is a project based course. Its primary objective is to both engage and excite students with hands-on science & engineering projects. The course will culminate with a challenging, but enjoyable capstone project: students will design their own house and learn how to represent their design through 3-dimensional drawings. Topics include: Engineering Design; Construction Technologies; Energy Systems; and Electric Circuits. Emphasis is placed on logical thinking, problem solving, and the use of basic algebra skills. Further, the course will attempt to integrate knowledge and skills from applicable trades into class discussions and assignments.

## **SOCIAL STUDIES**

### **WORLD HISTORY- HONORS**

The course content will cover the Enlightenment ideas that led to revolutions in Europe and the Americas, the rise of nation states, and the cultural, economic, and political roots of the Modern world. Additionally, students will study the 19<sup>th</sup> century reform movements, Great Depression, World War I, World War II, and the Cold War. Finally, students will examine self-determination movements throughout the 20<sup>th</sup> Century. Emphasis is placed on expository writing, close of reading non-fiction and fiction texts, project based learning, and a survey of world geography. Students will accomplish the learning concepts of this course through the use of novels, document based questions, films, documentaries, and discussion. The curriculum is aligned with the Massachusetts History and Social Studies Frameworks.

### **WORLD HISTORY - CP**

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

### **UNITED STATES HISTORY 2 – HONORS**

The course begins with the study of the United States emergence as a powerful, modern and industrialized nation by the turn of the 19<sup>th</sup> century. The course continues with the examination of the political, social and cultural development of the United States in the early 20<sup>th</sup> century. The causes and effects of World War I, on the United States and the world will also be studied. Students will also study the Roaring 20's and its' aftermath, the Great Depression and New Deal. The course concludes with an examination of the rise of fascism and militarism and how the Allied countries were able to defeat Germany, Italy and Japan, in World War II. Students will accomplish

the learning concepts of this course through the use of novels, document based questions, films, documentaries, and discussion. Emphasis is placed on expository writing and close reading of fiction and non-fiction texts. The curriculum is aligned with the Massachusetts History and Social Studies Frameworks.

### **UNITED STATES HISTORY 2 – CP**

In this course begins with the study of the United States emergence as a powerful, modern and industrialized nation by the turn of the 19<sup>th</sup> century. Emphasis is placed on expository writing, close reading of fiction and non-fiction texts, study, and organizational skills. Students will accomplish the learning concepts of this course through the use of novels, document based questions, films, documentaries, and discussion. The course continues with the examination of the political, social and cultural development of the United States in the early 20<sup>th</sup> century. The causes and effects of World War I, on the United States and the world will also be studied. Students will also study the Roaring 20's and its' aftermath, the Great Depression and New Deal. The course concludes with an examination of the rise of fascism and militarism and how the Allied countries were able to defeat Germany, Italy and Japan. The curriculum is aligned with the Massachusetts History and Social Studies Frameworks.

### **UNITED STATES HISTORY 3 - HONORS**

Students will engage in a variety of writing, research and higher level critical thinking related activities and assignments and assessments in this course. Technology, media, literary and primary document resources will be utilized to examine the impact of recent contemporary United States history on current day affairs. Graphic and comprehensive nonfiction and historical novel readings serve as tools of understanding as well as expanding thought of how history affects the present and future. Students examine how the United States began to assume worldwide responsibilities as the leader of the free world in the Cold War Era. Students will also analyze the important political, economic and social changes during the 1950's through the 1970's which include The Civil Rights Movement and Vietnam War Era. The curriculum is aligned with the Massachusetts History and Social Studies Frameworks.

### **UNITED STATES HISTORY 3 – CP**

In this course, students will engage in a variety of writing and analysis activities that lead to understanding how recent contemporary United States History continues to affect our society today. Various media, including those which connect to primary source documents and video, will be utilized to trace and detail events and analyze historical relevance to the past and present. Letters, speeches and books in graphic and narrative styles will serve as resources of information and deepen understanding of course content. The course first reviews the effects of World War II. Emphasis is placed on the role the United States played in the postwar era that evolved into the Cold War era. The Cold War emergence, Civil Rights Movement, Vietnam War and Watergate scandal time periods and events will be major areas of concentration, as well as social movement causes within the United States. The curriculum is aligned with the Massachusetts History and Social Studies Frameworks.

### **TOPICS IN UNITED STATES HISTORY 3**

This course serves as a topical survey study of United States History of the post-World War II Era up to the post 9/11 era. The Presidencies of Truman to Obama will be addressed and analyzed for major historical and societal impact on the United States and the role it plays in world affairs. Major focus areas include the Civil Rights Movement, the Vietnam War, Watergate as well as the changes the United States experienced with the emergence of The New Frontier and The Great Society programs. Social movements which helped shape government action to provide and protect the rights of women, various ethnic groups and all citizens are also highlighted. Emphasis is placed on how these developments affect the current welfare and status of the United States as a country and its citizens as well. Emphasis is placed on study and organizational skills expository writing, close reading of non-fiction and fiction texts. The curriculum is aligned with the Massachusetts History and Social Studies Frameworks.

## ACADEMIC SUPPORT

### **ENGLISH LANGUAGE LEARNERS - BASIC**

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

### **ENGLISH LANGUAGE LEARNERS - INTERMEDIATE**

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

### **ENGLISH LANGUAGE LEARNERS - ADVANCED**

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

### **ESSENTIAL CONCEPTS OF BIOLOGY**

Essential Concepts of Biology is designed for students who have not passed the biology MCAS exam. A diversity of learning methods are utilized to increase student understanding of the key concepts identified in the Massachusetts Learning Standards for Biology. Test taking skills will also be emphasized.

### **ESSENTIAL CONCEPTS OF ENGLISH**

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

### **ESSENTIAL CONCEPTS OF MATH**

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

### **GEOMETRY FOUNDATIONS**

Geometry Foundations is provided to eligible students based on ability level and specific learning needs. The course provides an individualized learning center environment equipped with math software technology and tutoring assistance to meet a wide variety of math student learning needs. Such needs include, but are not limited to, extended time on learning, review of basic math, and skill development in algebraic concepts. Eligible students are identified and given support as needed by math instructors.

## **READERS/WRITERS WORKSHOP 1**

The primary emphasis of this course is to improve each student's ability to communicate effectively through the use of strategic reading, writing, speaking, and listening skills. Instruction is tailored to students' individual learning needs, based on a variety of assessments, and includes extended learning time. The goal is to provide students opportunities to increase motivation, independence, and transfer of literacy skills to their academic, professional and personal lives.

## **READERS/WRITERS WORKSHOP 2**

This course builds on the foundation of Reader/Writer Workshop I with continued opportunities for students to deepen knowledge and improve skills in reading and writing, speaking and listening. Instruction is tailored to students' individual learning needs.

## **STUDY SKILLS**

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

# **TRANSITIONAL OCCUPATIONS PROGRAM**

## **THE TRANSITIONAL OCCUPATIONS PROGRAM**

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

## **FUNCTIONAL ENGLISH LANGUAGE ARTS**

ELA is designed to improve each student's reading, writing, vocabulary, speaking, listening, and critical thinking skills. The curriculum is aligned to meet the Massachusetts Curriculum Frameworks. The focus is on exposing students to a variety of high interest literature that includes novels, short stories, plays and poetry. The development of vocabulary is supported by the reading materials.

## **FUNCTIONAL MATHEMATICS**

Math focuses on functional math that students need for everyday life (Time, Money, Use of Calculator etc.) The 10th grade curriculum also introduces Geometry, Algebra and Number Sense in order to assist the students to complete their requirements for the MCAS Alternate Assessment portfolios.

## **SCIENCE**

Science is standards and curriculum that focuses on ecosystems using the Biology Frameworks. This course is designed to meet the Biology requirements for the MCAS Alternate Assessment portfolios.

## **HEALTH**

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

## **ADOLESCENT ISSUES**

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

## **THEORY**

Theory curriculum focuses on providing students with general knowledge and skills to be career ready. Curriculum includes career exploration, job searching skills, communication in the workplace, demonstrate active listening skills, work ethic and professionalism. Standards and curriculum focuses on employability and career readiness knowledge and skills.

## **SELF ADVOCACY/AWARENESS**

Self Advocacy/Awareness courses are designed to help students with disabilities build independence in school and into adulthood. The curriculum focuses on teaching students to be assertive, know their rights, and resolve conflicts. Students learn ways to effectively express their feelings, utilize coping strategies, handle and react to bullying. Students participate in lessons that will assist them in the transition from school to employment.

## **TRANSITIONAL OCCUPATIONS SHOP**

Shop curriculum focuses on providing students with hands on skills to be career ready. Curriculum includes content in the Culinary field and/or CVS/Retail fields focusing on communication in the workplace, demonstrate active listening skills with a high focus on Vocational Standards.