

# Greater Lowell Technical High School

*2018-2019 Program of Studies*



*Joseph Mastrocola, Superintendent-Director*

*Jill Davis, Assistant Superintendent/Principal*



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## **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

**Joseph M. Espinola, III**  
Dracut, Vice-Chair

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

**Raymond J. Boutin**  
Lowell

**Curtis J. LeMay**  
Lowell

**George W. O'Hare**  
Lowell

**George A. Tatseos**  
Tyngsboro

**Kempton P. Giggey**  
Dunstable

## *Administration*

**Joseph Mastrocola**  
Superintendent-Director

**Jill Davis**  
Assistant Superintendent/Principal

**Jeffrey Albert**  
Director-Special Education

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

**Michael Barton**  
Director-Curriculum/Instruction & Assessment

## *Directors*

**Linda Arsenault**  
**Stacy Bezanson**  
**Mark Byrne**  
**Jamie Costa**  
**Lisa Martinez**  
**Kristin Foti**  
**Christine Messina**  
**Kathryn Tierney**  
**Billie Jo Turner**  
**Mark White**  
**Linda Zambino**

Director-Grant Funded Programs  
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  
School Business Administrator  
Director-Athletics/Physical Education Cluster Chair  
Assistant Principal

## *Cluster Chairs*

**Carol Chisolm**  
**Donald Ducharme**  
**Ronald Vercellone**  
**Maureen Griffin**  
**Daniel Hamel**  
**Margaret Sarmiento**  
**Jennifer Zeuli**

Science & Mathematics Cluster Chair  
Transportation/Manufacturing Cluster Chair  
Dean of Discipline & Attendance  
Personal Services Cluster Chair  
Construction Cluster Chair  
Technology Cluster Chair  
Humanities 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, religion, national origin, pregnancy, sex, gender identity, sexual orientation, age, veteran status, disability, or homelessness in admission, treatment or access to its programs and activities, as defined and required by state and federal law. In addition, Greater Lowell Technical High School does not discriminate in employment in its programs or activities and is committed to providing an environment free from sexual harassment and prohibits retaliation against any individual for making a complaint of conduct prohibited under this Notice, or for assisting in the investigation of such a complaint. 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,



Joseph Mastrocola  
Superintendent-Director



# GREATER LOWELL TECHNICAL HIGH SCHOOL

## Mission Statement

Greater Lowell Technical High School commits to ensure students' readiness for career, college, and citizenship in the 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.





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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 obtain an online application from their local school Guidance Counselor or by

contacting the Greater Lowell Technical High School Admissions or Guidance Office as early in the school year as possible.

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

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

- a. Complete their portion of the applications to the Greater Lowell Technical High School Guidance 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 guidance 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 guidance counselor.

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

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

- a. The Greater Lowell Technical High School Admissions or Guidance Department will notify the local School Guidance 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 Guidance Counselor.
- c. If after notifying the local school Guidance 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 Guidance Counselor or by contacting the Greater Lowell Technical High School Admissions or Guidance Office as early in the school year as possible.
  - b. Complete an application and inform their local school Guidance Counselor by the deadline set by the sending school’s Guidance Department.
2. It is the responsibility of the local school Guidance Counselor to:
  - a. Complete their portion of the application form.
  - b. Forward the completed applications to the Greater Lowell Technical High School Guidance 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 Guidance Counselor is required.
3. If incomplete applications are received, the following procedures will be followed:
  - a. The Greater Lowell Technical High School Admissions or Guidance Department will notify the local School Guidance 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 Guidance Counselor.
  - c. If after notifying the local school Guidance 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 Guidance Counselor's Recommendation: Maximum 10 points

A member of the Guidance 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 guidance 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 by contacting his/her guidance counselor. Transfer requests will be considered subject to the availability of openings in the requested shops. Each transfer applicant will be interviewed and counseled individually 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
MATHEMATICS		
64	Algebra 2 - Honors .....	6.0
63	Algebra 1 - Honors .....	6.0
63	Algebra 1 - CP .....	6.0
63	Algebraic Foundations .....	12.0
63	Pre-Algebra .....	6.0
PHYSICAL EDUCATION/HEALTH		
65	Teen Health. ....	3.0
65	Physical Education 9 <sup>th</sup> / Wellness .....	3.0
66	Adaptive Physical Education .....	3.0
SCIENCE		
66	Biology - Honors .....	6.0
67	Biology 1 - CP .....	6.0
SOCIAL STUDIES		
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>REQUIRED TOTAL CREDITS</b>		<b>48.0</b>

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**CREDIT GUIDE SHEETS – GRADE 9-12**

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

PAGE	ENGLISH	CREDITS
61	English 2 - CP.....	6.0
61	English 2 - Honors .....	6.0
	<b>MATHEMATICS</b>	
64	Geometry - Honors.....	6.0
64	Geometry - CP .....	6.0
64	Algebra 1 w/Geometry .....	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	Biotechnology 1 - CP .....	6.0
67	Environmental Science – CP.....	6.0
67	AP Environmental Science .....	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

**REQUIRED TOTAL CREDITS**

**48.0**

**CREDIT GUIDE SHEETS – GRADE 9-12**

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

PAGE	ENGLISH	CREDITS
62	English 3 – AP English Literature 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</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
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 Language and Composition	6.0
62	English Composition 1.....	6.0
63	English – Honors.....	6.0
63	English 4 - CP.....	6.0
	<b>MATHEMATICS</b>	
64	Calculus.....	6.0
65	Pre-calculus – Honors.....	6.0
65	Pre-calculus CP.....	6.0
64	Algebra 2 - CP.....	6.0
64	Trigonometry – CP.....	6.0
65	Probability and Statistics Applications.....	3.0
65	Probability and Statistics - Honors.....	6.0
65	Algebra 2 Applications - CP.....	3.0
	<b>PHYSICAL EDUCATION/HEALTH</b>	
66	Physical Education Upper 1 / Wellness.....	1.5
66	Upper Health 2.....	1.5
66	Adaptive Physical Education.....	3.0
	<b>SCIENCE</b>	
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	Biotechnology 2 - CP.....	6.0
68	Applications of Science – CP.....	3.0
69	Engineering Science - CP.....	3.0
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 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.

### **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.

### **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 of Limited English Proficiency. The goal of the program is to help students become proficient in English, reading, writing and math in order to succeed in mainstream 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.

### **GUIDANCE SERVICES**

The Guidance 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 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 guidance counselor to provide them with a four year college and career plan.

The Guidance 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.

Counselors provide a variety of student and community based services including, academic, career and postsecondary planning, and crisis intervention/resources. The Guidance 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 guidance 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. 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 counselor unless the reason for the meeting is of a critical nature.** Parents are encouraged to call or email

their child's 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.

## **STUDENT COURSE SELECTION**

Students attending Greater Lowell Technical High School will meet with his/her guidance 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 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 counselor on a frequent basis to ensure that college admission requirements are met.

## **COLLEGE & POST SECONDARY PLANNING**

Counselors assist students in the following ways:

- Course Selection
- 4-year Career Plan
- Guided Naviance Family Connection 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 guidance office to assist them in this process. The guidance office has computers available to the students to aid them in obtaining information about colleges and careers.

## **NAVIANCE & FAMILY CONNECTION**

Family Connection 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 Family Connection and is linked directly to the counseling office so that the 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.

Family Connection 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 Family Connection 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 Family Connection 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 collection, one of the largest and most comprehensive in a technical secondary school in the country, covers a variety of subjects that support our school's academic and technical programs. We also maintain general reference material and current and archived periodicals. Our team's priority is to provide students with up-to-date resources and we do so by constantly displaying our latest acquisitions-fiction books, graphic novels and career resources, among others-meant to encourage students to imagine, be proactive and be successful. We also offer an extensive number of on-line multimedia databases that are available to teachers and students at school and at home that are accessible through our web site at <http://www.gltech.org/Page/435>.

Our environment is designed to promote learning whether that is individual or in groups. For this purpose, in addition to the main center we have three computer labs for student/teacher use. The Library Media Center is open before and after school, during lunch, and with a pass throughout the day.

### **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, adaptive physical education 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.

Parent/Guardian(s) should contact the Section 504 Coordinator at 978-441-4951 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 fourteen (14) technical programs they selected to explore. Students will spend two periods each day for (10) days in each of the fourteen programs. This will enable them to discover their personal strengths and interests, and compare these with the work skills and requirements of these fourteen (14) 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 fourteen (14) 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 fourteen (14) 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.

## **Exploratory Programs Offered**

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  
Machine Technology  
Marketing  
Masonry  
Medical Laboratory & Assisting  
Metal Fabrication & Joining Technologies  
Painting and Design  
Plumbing  
Programming & Web Development

## **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:

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  
Machine Technology/Manufacturing & Transportation  
Marketing/Personal Services  
Masonry/Construction  
Medical Laboratory and Assisting/Technology  
Metal Fabrication and Joining Technologies/Manufacturing & Transportation  
Painting and Design/Construction  
Plumbing/Construction  
Programming & Web Development/Technology

# TECHNICAL COURSE DESCRIPTIONS

## **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**

Automotive Salvage Yard Person              Automotive Supply Store Person  
Custom Painter                                      Custom Metal Fabricator  
New and Used Car Lot Attendant              OEM & After Market Parts Specialist  
Spray Painter                                        Tow Truck Operator

## **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 which includes the MegaTech computer training system, 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 and ALLDATA training). 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

Gasoline Station Attendant  
Lubrication Person

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

Automotive Repair Shop Owner  
Electronic Diagnostic Specialist  
Factory Representative  
Service Manager

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

##### **Related Occupations**

Automobile Salesman  
Automotive Salvage Yard Person

Automotive Parts Salesperson

#### **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 power machines. They will learn to identify, estimate and properly store lumber and building materials. The first two terms will be focused on woodworking practices and shop techniques. During the third and fourth terms, emphasis will be placed on house building and basic framing.

#### **CARPENTRY SHOP 3**

The student is instructed on safety factors and the use of both handheld and stationary power machinery. Machines such as the joiner, planer, and table saw are used extensively. The students are instructed on proper

work habits and ethics. The students get to experience real working conditions on the outside house project. Students actually build a small residential dwelling from the frame, roof, siding to cabinet installation and interior finish. The conditions are real . . . from the sunshine to the rain, mud, snow and cold. Students are responsible for estimating, blueprint reading, math calculations, layout and construction of the house. Safety under these conditions is of the utmost importance.

### **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 with jigsaw routers to do production work, while learning the care and maintenance of woodworking tasks. 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 dry and iron work and nail care. Students are made aware of the 1,000 mandated hours required by the State Board of Cosmetology as well as the responsibility to purchase a kit and uniform for each level of shop once accepted into the program.

## **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 and make up application. 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 and participate in a design project that will be continued throughout the students shop/related classes junior and senior year.

## **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 sixteen 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, scalp treatments, hair cutting and state board techniques of facials, makeup, perm winding, finger waving 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, personal image, communication skills 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, and basic color. Also, scalp treatments, manicuring, and facials with massage techniques are practiced for state board regulation competency. Upon completion of this course, students will be prepared to work in the clinical environment that is in place in Cosmetology Shop Level 4.

### **COSMETOLOGY THEORY 3**

Students, during their junior year, who are 16 years of age, will start accumulating required state board hours. During this year students will continue to develop the ability to analyze the theory part of cosmetology by demonstrating an understanding of disinfectants, permanent waves, hair color, and skin and hair products. The curriculum will also expose students to real-life expectations. The curriculum will also expose students to real life expectations through roleplay of an interview process, resume development and job searching using multiple resources. Juniors will also be introduced to “Milady Pro” which is a software program that includes tests, reviews and reports of their chapter progress. Milady Pro is a crucial resource in a student’s preparation for the licensing exam. This program can also be accessed on their home computers. Once the students become sixteen years old, their class attendance, hours will be added toward their goal of 1000 hours mandated by the State Board of Cosmetology for licensure. The necessary books and study aids are included in the required starter kit purchased for Level 2 Cosmetology Shop.

### **COSMETOLOGY SHOP 4**

This is the third year of the three (3) year program. The mandatory 1,000 hours may be completed during this time provided a student turned sixteen years of age prior to entering their junior year. According to State Board of Cosmetology regulations, a student must be sixteen years of age to accrue hours. Students may participate in the cosmetology program but will not accrue hours toward the mandatory 1000 hour requirement until they are sixteen years of age. Due to this regulation, some students may not be allowed to apply for licensure because they have not accrued enough hours. Shop 4 is conducted similar to an actual salon environment, whereas students perform various cosmetology services on actual clients.

### **COSMETOLOGY THEORY 4**

Cosmetology Theory 4 continues to cover all aspects of hairdressing including advanced styling, hair coloring, perming, hair straightening, anatomy, histology, job interviews and salon management. Students prepare for the written State Board Exam and file an application to take the State Board Exam. Students who pass this exam will receive their operator’s license which will enable them to work in a hair salon. Seniors will continue using the Milady Pro Software to prepare for the written portion of their state board exam.

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

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

Salon Operator  
Receptionist

Manicurist  
Wig Stylist

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

Aesthetician  
Product Demonstrator  
Salon Manager  
Cosmetology Teacher  
Wig Maker

Color Technician  
Make-up Artist for Theater  
State Board Inspector  
Waxing Technician  
Nail Technician

##### **Related Occupations**

Beauty Editor and Writer

Beauty Supply Owner

## **CULINARY ARTS EXPLORATORY**

Culinary class students will be introduced to cooking and academic techniques that will be currently used in the culinary industry. A wide variety of industry tools and equipment will be used throughout the ten day course. Each student will have the opportunity to produce up to six 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**

The world of Culinary Arts continues to offer diverse opportunities in pastry arts, in becoming the next “Top Chef” or in managing a restaurant. Student skill sets continue to build on fundamentals experienced in the 3 week exploratory. Cooking tasks expand as students work in teams, practicing and maintaining sanitation and safety standards throughout. Students utilize their writing and math skills to formulate recipes, to write menus and follow industry videos. Cooking techniques and knife skills are learned through hands-on cooking tasks. Students taste new ingredients during this time while cooking and during chef demonstrations. Students will tour the three shop areas, allowing them to meet the instructors. Students will also be trained and tested on up to twenty pieces of equipment, with a main focus on safety. All culinary students will be fitted for uniforms at this time to facilitate a smooth transition to sophomore shop.

## **CULINARY ARTS SHOP 2**

The first year of this three year program provides instruction in the areas of terminology, stocks, sauces, salads, dressings and vegetable preparation. Students are also provided with foundation skills in the area of baking terminology and the correct use of scales, weights, measures and the identification of ingredients. Students are introduced to commercial type recipes, basic principles of bake shop production and recipe conversion. Training as a bakery counter clerk and bakery cashier are provided. Students are also assigned to the Artisan Restaurant where they serve as wait staff and bus person.

## **CULINARY ARTS SHOP 3**

The second year of this three (3) year program re-emphasizes the many positions available to students in food service. Students will be introduced to banquet preparation and cooking, as well as, banquet setup and service. Derivatives of the basic soups and sauces are prepared, as well as all the different cooking techniques, such as braising, frying, broiling, etc. There is an introduction to basic cake decorating and to Danish and French Pastry. Students are introduced to specialty dessert recipes and plate decorating. Students continue to work as counterpersons, becoming proficient in cash register operations. Introduction is given to garde manager, specialty items, canapé trays, fancy finger foods, molds, plus simple decorating ideas. Students will continue to work as wait staff in the school operated restaurant and may serve in the capacity of manager or assistant manager. A combination of field trips and guest speakers will expose students to the Culinary Institute of America, Johnson & Wales University, Newbury College, and other prominent post-secondary opportunities at culinary arts colleges. Students continue to acquire ACF competencies as they progress through the program.

## **CULINARY ARTS THEORY 3**

This course affords the opportunity to develop a strong foundation in the foodservice industry. Students will be introduced to safety and sanitation, standard recipes, metric measurements, and conversions between measurements. ServSafe, a nationally recognized program, is offered so that students may obtain a five year certificate in sanitation that is accepted everywhere in the country and could potentially earn them college credit. Students are also given the opportunity to obtain a General Industry OSHA Safety Card.

## **CULINARY ARTS SHOP 4**

This program will allow the student to begin a Co-op work study program or continue to specialize in related areas of the culinary industry. All areas of this shop will concentrate on the refinement of the hands-on, individualized training that will ensure that the student is prepared to build a career within the culinary field. In addition to Co-op, the final year of this program involves the student with heavy meat cookery, including veal,

chicken, beef, pork and fish. Recipe conversion, cost analysis and food costs highlight this course. On the baking end, merchandising, advertising and selling are covered as well as the preparation of party pastries, pate a choux, cooked icings and fillings. Preparation of ethnic foods will be explained through our menu and daily specials. Students will take an active role in the management of the restaurant. In this capacity they are responsible for the total operation of the restaurant including completing daily cash reports and making bank deposits. Students are eligible to participate in the cooperative education program in their senior year, providing them with real world experience at local restaurants, bakeries and foodservice establishments.

#### **CULINARY ARTS THEORY 4**

In the second part of the Culinary Arts Theory class students will continue learning about conversions between units of measure. They will build on their culinary math skills by learning how to utilizing As-Purchased Quantity and Edible Portion Quantity to determine ordering amounts. They will also apply Edible Portion Cost and As-Purchased Cost formulas to determine selling prices of menu items. Students will also be introduced to Entrepreneurship skills and will be guided through a business planning procedure. At the end of the course students will have a usable business plan.

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

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

Apprentice Baker  
Bench and Oven Assistant  
Cashier  
Dish and Pot Washer  
Salad Preparer  
Waiter/Waitress

Apprentice Pastry Chef  
Bus Person  
Cooks Helper  
Icing and Finishing Assistant  
Short-Order Cook

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

Bakery Manager  
Bench and Oven Person  
Cake Decorator  
Executive Chef  
Icing and Finishing Person  
Hotels, Hospitals, Cafeterias  
Pastry Chef

Banquet Chef  
Butcher  
Culinary Arts Teacher  
Head Baker  
Manager for Restaurants,  
Mixing Person  
Second Cook

##### **Related Occupations**

Bakery Delivery Person  
Bakery Salesperson  
Food Salesperson

Bakery Owner  
Banquet Manager  
Hotel Maitre'd

#### **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 experience 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 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 design & visual communications person.

## **AP STUDIO ART PROGRAM**

AP Studio Art Program offers three studio art courses and portfolios: Two-dimensional Design, Three-dimensional Design, and Drawing. The AP Studio Art portfolios are designed for students who are seriously interested in the practical experience of art. Students submit portfolios for evaluation at the end of the school year. The AP Studio Art Program consists of three portfolios — 2D Design, 3D Design and Drawing — corresponding to the most common college foundation courses. Students may choose to submit any or all of the Drawing, Two-dimensional Design, or Three-dimensional design portfolios. AP Studio Art students create a portfolio of work to demonstrate the artistic skills and ideas they have developed, refined, and applied over the course of the year to produce visual compositions.

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

In Design and Visual Communications Shop 3, 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 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 students 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 Graphic Communications/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 opportunities in the early childhood education field. 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. The student gains valuable experience by observing and working with children in our on-campus preschool known as the “Tot Shop”. Students will participate in hands-on activities using art, music, children’s literature and technology. This course will also cover professionalism and employability skills, child development, assessment methods, preschool classroom design and lesson planning.

#### **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.

### **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, and communication skills.

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

This course is designed to help students understand how to work with and care for children. A major emphasis of this course is guiding children’s development and meeting developmental needs from the preschool age through school age years. In addition, this course will explore play activities, ways to keep children healthy and safe, group programs and preparing for child-care related careers. Students will also complete OSHA training and earn their 10-hour OSHA card. In early childhood education, students in grade 10 develop the skills and abilities to cooperatively work as a team providing care in the preschool setting. Students will become familiar with how children play and learn and how to support their growth and development. Students will gain the skills necessary to accomplish the daily routine tasks associated with caring for young children. Students will learn how to plan developmentally appropriate activities for each learning center in the classroom. Students will continue to develop employability skills such as professionalism, communication skills, time management, teamwork and interviewing strategies for employment after graduation.

### **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**

Students focus on improving their professional and employability skills as well as caring for the child’s basic needs such as health and wellness and the prevention of child abuse. Students explore the field of education for children with special needs. Development of personal teaching styles will be discussed while studying the classroom management, discipline, and developmentally appropriate curriculum. Upon successful completion of the program, students may apply to get an assistant teacher or teacher certificate from the Department of Early Education and Care for either infant/toddlers and/or preschool.

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

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

Infant/Toddler Assistant Teacher or Teacher  
Kindergarten Aide in Public Schools  
Day Care Center Aide  
Special Needs Aide

Preschool Assistant Teacher  
Counselor Before/After School Care  
Family Day Care Provider

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

Adoption Agency Worker  
Counseling & Psychology

Child Life Teacher/Worker  
Elementary Education Teacher

Head Start Teacher  
Special Needs Teacher  
Child Development Consultant

Kindergarten Teacher  
Expressive Arts Therapist  
Infant Intervention Specialist

### **Related Occupations**

Camp Counselor  
Recreation Program Aide  
Play Therapist  
Social Service

Nanny  
Psychologist  
School Counseling

## **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.

### **ELECTRONICS SHOP 1**

The shop one student is prepared for entry into the 10<sup>th</sup> 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.

### **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 course continues with various uses for the 555 timer. Construction of 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.

### **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 Dynalogic boards and Multisim software will aid in the understanding of digital. Throughout the course the student will demonstrate language arts and communication skills, apply mathematical strategies to solve problems (STEM), communicate in multiple modes to address needs within the career and technical field, solve problems using critical thinking, demonstrate positive work behaviors, demonstrate ability to use technology for research, problem solving, and communication.

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

The 11<sup>th</sup> 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. Course material include (The Associate CET Study Guide, 6<sup>th</sup> Edition, Published by ETA<sup>®</sup> International) and (Introduction to Electronics, 6<sup>th</sup> 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.

## **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.

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

The 12<sup>th</sup> Grade course is a continuation of the 11<sup>th</sup> 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

Electronic Stockperson

Bench Technician

Field Service Technician

Radio-Television Technician

Computer Technician

Electronic Wirer and Assembler

Help Desk Technician

Photocopier Repairperson

Video Game Technician

Home & Small Business Networking Technician  
Test Technician  
Electronic Salesperson

Electromechanical Assembler  
Remote Service Technician

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

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

Computer Design Engineer  
Electromechanical Inspector  
Electrical & Engineering Assistant  
Microwave Engineer  
Satellite System Designer  
Calibration Technician  
Test Equipment Technician  
Home Entertainment Technician

### **Related Occupations**

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

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 world employability skills that will prepare them for possible co-op placement and employment after graduation. This course can lead to college credit.

### **ENGINEERING TECHNOLOGY 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 Advanced Engineering Shop provides students with an array of opportunities which vary from co-op employment to advanced Computer Integrated Manufacturing and Civil Engineering and Architecture study. Students participating in co-op employment will be given the opportunity to work during their shop building upon their technical skills at a company doing business in the tech/ engineering field, off school grounds at the business location while getting paid. For students looking to further their experience with digital fabrication equipment they will have the opportunity to dive deeper using our Engineering Maker Space equipped with 3d printers, 3d scanners, CNC Mills, CNC Lathe, CNC Router, Laser Engraver, CNC Wire bender and more Industry 4.0 tools.

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

### **Related Occupations**

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

## **GRAPHIC COMMUNICATIONS 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 Design Premium Suite. Through project-based learning, the students will have the opportunity to learn the basics of Photoshop, Illustrator and Dreamweaver. The students are encouraged to express themselves creatively.

## **GRAPHIC COMMUNICATIONS SHOP 2**

The Graphic Communications 10<sup>th</sup> grade experience 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 graphic communications 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. Graphic Communications 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 to correctly 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**

Students in shop 3 select a choice of specializing 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 vinyl sign production. 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 for a sign. 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. Students will apply vinyl vehicle lettering to various substrates, and install various types of signage.

### **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**

This course 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 and electronic graphic design. 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 thumbnail sketches, layout and design, and type face selection. In most instances, the student acts as a journeyman's apprentice and works with grade 10 and grade 11 students. Grade 12 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. Students will apply vinyl vehicle lettering, vinyl lettering to various substrates, and install various types of signage.

### **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**

Graphic Designer  
Press Assistant  
Sign Artist

Layout Artist  
Pre-Press Designer  
Bindery Assistant

**With Experience and/or Advanced Training**

Graphics Project Director  
Merchandising & Print Production Manager

Printing press operator

**Related Occupations**

Copy Preparation Person  
Offset Press Operator  
Production Manager, Advertising

Layout and Design Person  
Platemaker

**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. Selected on-site clinical observations are provided through the use of local health care agencies when possible. A shop uniform is required. All students will be fitted for uniforms at this time to facilitate a smooth transition to sophomore shop.

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

This course is designed to build an awareness of the many dimensions of the health care 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. Clinical experiences may include the following: preschool classrooms, adult day care centers, nursing homes, assisted living facilities, and various allied health care 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 health care ladder which will enable students to successfully continue on to shop 3. Under the direction of the Medical Assisting instructor, the students are introduced to the role of the Medical Assistant in a medical practice or outpatient setting. The clinical procedures and techniques will include admitting a patient to the office, assisting with examinations and clinical procedures, communication skills, and measuring and recording vital signs. Students will also learn sterile technique, audiometry and visual screening.

**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 Shop 3 curriculum is designed to provide students with learning experiences that will prepare them to meet the nurse aide certification requirements. The students are given opportunities to obtain basic nursing aide skills, personal care skills and basic restorative services. Students are prepared to be tested by the 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. Students also complete a 10-hour OSHA certification course. In addition, the Health Assisting curriculum includes Clinical Laboratory Procedures. Under the direction of the Medical Assisting instructor, students will be introduced to the practical application of urinalysis, special laboratory procedures, basic microbiology, pharmacology, dosage calculation, and medication administration. Students will be instructed in laboratory safety, aseptic technique, 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. Students will receive training on CLIA and its implications in the laboratory setting. Instruction will include the capillary finger stick procedure. All students will be clinically certified in this procedure 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's stain technique. Students will be introduced to microscopy, as it relates to the observation of blood cells and bacteria. Students will learn about the diseases associated with these tests and will practice the documentation of the laboratory results. Students will be introduced to phlebotomy which prepares the student to perform multiple venipuncture techniques. The program provides training in aseptic techniques and universal precautions. The students will learn the correct tubes and additives used for each venipuncture procedure. In addition, emphasis will be placed upon clinical technique, specimen handling, labeling, charting, and professionalism.

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

The Health Assisting/Pre-Nursing Theory 3 program is twofold. The first half of the year is focused on the aging process. Emphasis is placed on the physical changes and associated health problems which require professional care and/or long-term institutional care as well as communication skills, ethics, and problem solving methods. In addition, students will have the opportunity to obtain an in-house certification in Alzheimer's Care. The second half of the year the focus is on 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 students will be given the opportunity to take the PTCE- Pharmacy Tech Certification Exam and become a Nationally Certified Pharmacy Technician.

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

The Health Assisting/Pre-Nursing Shop 4 Program is designed for those senior students who have successfully completed the Health Assisting/Pre-Nursing Shop 3. Students have the opportunity to become certified in basic life support for healthcare providers, first aid, electrocardiograph technicians, 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.

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

The goal of the Health Assisting/Pre-Nursing Theory 4 program is to provide the students with the theory and skills in electrocardiography, pharmacology and patient care technician. These skills will allow the student to take the National Health Association Certified Electrocardiography Technician Exam, to explore entry-level pharmacy technician, and to qualify as a patient care technician in the acute setting.



**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 ten 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 in the Artisan Restaurant and Cafe. The innovative curriculum places an emphasis on the development of employability and professional skills.

### **HOSPITALITY MANAGEMENT SHOP 1**

Shop 1 experience takes a hands-on approach where students will shadow and observe the daily operations of the Artisan Restaurant and Café with a focus on table set-up and service. Students will also have the opportunity to take a property tour of local hotels. Students will work on employability and communication skills as well as team building.

### **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 course 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. Students will gain real world experience in the school's Artisan Restaurant and function room. Students are trained and acquire basic technical skills in dining, banquets and customer service practices. Students will gain experience working in a local hotel and rotate through the following hotel departments; front desk, human resources, restaurant, kitchen, banquets, housekeeping, laundry, administration, accounting, and engineering. 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.

### **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, leadership concepts, and the theories that form a basis for success in the supervision of customer service for the hospitality industry. 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 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.

### **HOSPITALITY MANAGEMENT SHOP 4**

The Hospitality Management Shop 4 course will allow students to participate in various Co-op work study programs with local hospitality businesses or continue to work at local hotel. Students who continue to work in the local hotel will narrow their focus to specific career direction building on competency levels, confidence and employability. The students will assist in training junior students and work towards more management responsibilities in their departments. Students are prepared for future employment or postsecondary education opportunities.

## **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.

### **Career Opportunities in Hospitality: 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

## **MACHINE TECHNOLOGY EXPLORATORY**

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

## **MACHINE TECHNOLOGY 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.

## **MACHINE TECHNOLOGY 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.

## **MACHINE TECHNOLOGY 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.

### **MACHINE TECHNOLOGY 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.

### **MACHINE TECHNOLOGY 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.

### **MACHINE TECHNOLOGY 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 Machine Technology:**

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

Band Saw Operator  
Lathe Operator  
N.C. Miller Operator

Drill Press Operator  
Machine Operator  
Surface Grinder Operator

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

CNC Machine Programmer  
Instrument Maker  
Jig and Fixture Maker  
Machine Technology Teacher  
Tool and Die Maker

Inspector  
Jig Borer  
Machine Setup Person  
Tool and Cutter Grinder

##### **Related Occupations**

Machine Oiler  
Tool Crib Attendance

Material Handler

### **MARKETING EXPLORATORY**

This exploratory will introduce and allow students to explore career opportunities in the areas of marketing, retailing, advertising, wholesaling, purchasing, and entrepreneurship. Students will learn to handle money, create mall displays and organize promotional activities for the Marketing Mall Stores.

### **MARKETING SHOP 1**

This shop 1 is designed to provide students who plan to enter this program with the basic skills and abilities necessary for success in the program. Students will be given the opportunity to progress at their own rate by use of competency based projects and methods of instruction. Students will have the opportunity to participate in a mentoring program with junior/senior level students in a variety of job-site situations in the 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 allow participation 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, aid in the development of basic skills, marketing skills and work 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 activities include: purchasing for resale, merchandising products, inventory control systems for retail, cash control systems for retail, materials handling, safety and store maintenance, business and technology applications for retail, entry level retail occupations and entry level/retail promotional occupations, and portfolio development.

In addition, students will learn, apply and perform fundamental financial concepts and applications. These financial concepts are insurance (life, property, health and auto insurance), budgets (personal, family and business), services offered by financial institutions and taxes (sales, property and excise). In addition, students will perform financial functions utilizing an automated simulation. Tasks included in this automation are recordkeeping for sales (cash, charge and returns), open and maintain a business checking account, as well as those financial tasks associated with office manager and bookkeeper industry related positions.

## **MARKETING SHOP 3**

Students are provided with actual management experience in various areas of Marketing which also includes the operation and merchandising of the Mall Stores. Students are responsible for the management of individual departments. Duties include buying, pricing, receiving, advertising and displaying, banking procedures and sales. Students also train in LogiVision, a computerized POS system that includes 4 computer POS terminals, and a back office terminal. LogiVision is a fully integrated, on-line retail management system that provides students with advanced technical training. The system includes Point of Sale; Inventory Control and General Ledger, scanners, customer displays and barcode ticketing. Students are also provided the opportunity to attend in store and out of school merchandise buying trips. This provides the student with an overall view of store operations, the functions of management and an opportunity to actually experience the relationship of the many areas of employment in the field of marketing. Students also have the opportunity to participate in the Greater Lowell teller training program located within the school's branch of the Lowell 5¢ Savings Bank. Students are encouraged to participate in Skills USA, 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.

## **MARKETING THEORY 3**

Students are exposed to a comprehensive view of the world of marketing through curriculum materials that meet National Marketing Education Standards and the Massachusetts Vocational Technical Frameworks. Course content includes real world applications, curriculum for competitive events, economics, communication and interpersonal skills. Also covered are the areas of product development, management, distribution, marketing information, management, pricing, product/service management, promotion, and selling. Individualized review, assessment, and integration of technology will prepare students for the world of marketing today and in the future. Students also use a variety of workbooks and learning guides that concentrate on store operations, selling and safety. Students will also complete the on-line OSHA course Career Safe and will receive a Career Safe Certificate and OSHA card. Curriculum materials meet National Marketing Education Standards and Massachusetts Vocational Technical Frameworks.

## **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 technical and marketing skills by working and producing a variety of production projects as directed by the Shop instructor. 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 course focuses on the development of future entrepreneurs. The curriculum is designed to instill a sense of entrepreneurship in our students. This curriculum was developed by the marketing education staff at Greater Lowell. It is a model curriculum, competency-based and used throughout the Commonwealth of Massachusetts. This course concentrates on the skills, characteristics and knowledge necessary to be a successful entrepreneur. A major portion of this course deals with the development of a business plan, business operations and business management. Projects also focus on researching and identifying successful entrepreneurs in our community as well as nationally. Students in this course are also provided the opportunity to discuss problems and situations which may occur on the students' Co-op placement job or in the Marketing Education Mall.

#### **Career Opportunities in Marketing Education:**

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

Advertising Clerks	Advertising & Publication Worker
Assistant Buyer	Bank Teller
Cashier	Cash Office Worker
Catalog Sales Representative	Direct Marketing Representative
Display Assistant	Home Shopping Network Representative
Insurance Sales Worker	Inventory Control Clerk
Marketing Research Worker	Materials Handler
Public Relations Clerk	Receptionist
Retail Salesperson	Security Personnel
Service Representative	Service Sales Representative
Stock Control Worker	Telemarketing Representative
Traffic, Shipping & Receiving Clerk	Wholesale & Manufacturers Representative

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

Accountant	Account Representative
Advertising/Display Manger	Advertising Sales Representative
Assistant Buyer	Assistant Manager
Buyer	Cash Office Manger
Customer Service Representative	Department Manager
Marketing Research Worker	Direct Mail Order Sales
E-Commerce Representative	Entrepreneur
Management Trainee	Marketing Education Teacher
Merchandise Manager	Operations Manager
Purchasing Agent	Store Manager
Store Owner	Training Director

##### **Related Occupations**

Accountant	Account Representative
Advertising/Display Manager	Advertising Sales Representative

Assistant Buyer  
Customer Service Representative  
Financial Services Marketing  
Food Products Marketing  
Home & Office Products Marketing  
Manufacturer's Sales Representative  
Recreation & Hospitality Marketing  
Tourism & Travel Marketing

Assistant Manager  
Department Manager  
Floristry Marketing  
Health Products & Service Marketing  
Insurance Marketing  
Real Estate Marketing  
Retail Marketing Operations

### **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, and a host of others. Basic first aid will be demonstrated and therapeutic communication will be emphasized. While working with upper classmen, students will have an introduction to the medical laboratory. 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 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. A shop uniform is required. All students will be fitted for uniforms at this time to facilitate a smooth transition to shop two.

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

This course introduces the students to the role of the Medical Assistant in a medical practice or outpatient setting. The clinical procedures and techniques will include admitting a patient to the office, assisting with examinations and clinical procedures, communication skills, and measuring and recording vital signs. Students will also learn sterile technique, audiometry and visual screening. Under the direction of the Health Assisting RN, BSN instructor students explore a curriculum that is designed to build an awareness of the many dimensions of the health care 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. Clinical experiences may include the following: preschool classrooms, adult day care centers, nursing homes, assisted living facilities, and various allied health care facilities.

### **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 maybe 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**

This course introduces the students to the practical application of urinalysis, special laboratory procedures, basic microbiology, pharmacology, dosage calculation, and medication administration. Students will be instructed in laboratory safety, aseptic technique, and the proper use of universal precautions. Emphasis will be placed on the incorporation of realistic clinic situations and critical thinking skills. The students will be expected to employ the skills they have learned in varied situations. Students will receive training on CLIA and its implications in the laboratory setting. Instruction will include the capillary finger stick procedure. All students will be clinically certified in this procedure 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's stain technique. Students will be introduced to microscopy, as it relates to the observation of blood cells and bacteria. Students will learn about the diseases associated with these tests and will practice the documentation of the laboratory results. Students will be introduced to phlebotomy which prepares the student to perform multiple venipuncture techniques. The program provides training in aseptic techniques and universal precautions. The students will learn the correct tubes and additives used for each venipuncture procedure. In addition, emphasis will be placed upon clinical technique, specimen handling, labeling, charting, and professionalism. In addition, this course includes a clinical practicum. The practicum is under the direction of the Health Assisting RN, BSN instructor. The practicum will provide learning experiences which will enable students to meet the nurse aide certification requirements. The students will be given opportunities to obtain basic nursing aide skills, personal care skills and basic restorative services. The students are expected to maintain a professional attitude, ethical behavior and develop positive communication skills. Students are prepared for testing 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 also complete a 10-hour OSHA certification course.

### **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 complete 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 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**

This course is a continuation of Medical Laboratory & Assisting Shop 3. Students have the opportunity to become certified in basic life support for healthcare providers, first aid, and learn about electrocardiograph procedures. Students have the opportunity to explore the entry-level role of the pharmacy technician. In addition, students will practice their clinical skills including vital signs, admission procedures, sterilization techniques, simulated sterile procedures and specialty examination procedures. The goal is to prepare a multidisciplinary health care worker who is cross trained for employment.

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

In the senior year, the focus is 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. 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	Arc Welder (all phases)
Tungsten Inert Gas Welder	Iron Worker
Oxy. Acet. Welder and Cutter	Press Brake Operator
Punch Press Operator	Shear Operator
Sheet Metal Worker Apprentice	Supervisor

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

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

##### **Related Occupations**

Drill Press Operator	Factory Benchhand
Grinder	Salvage Yard Person
Spot Welder	Stock Handler
Welding Supply Delivery Person	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. At the completion of this program, students will 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  
Drywall Finisher

Construction Painter  
Faux Finisher

Furniture Finisher  
Paint & Wallpaper Salesperson

House Painter (Interior & Exterior)

**With Experience and/or Advanced Training**

Art Guilder  
Industrial Sprayer  
Military Painter  
Painting Contractor  
Powder Coater  
Union Painter

Electrostatic Painter  
Interior Designer  
Mural Artist Painter  
Physical Plant Paint Foreman  
Set Design

**Related Occupations for Painting & Design**

Estimator  
Facilities Management  
Trade Shop Set-Up

Lead Paint Inspector  
Sales Representatives for Paint Manufactures

**PLUMBING EXPLORATORY**

The objective of this course is to give a brief overview of the opportunities available in the plumbing field and the knowledge and skills required to pursue a career in plumbing. Primary objectives are to acquaint the students with the basic facts and fundamentals of plumbing and pipefitting, to show the students the fundamentals of soldering-threading pipe and cast iron work using rules and tools, to explain the relationship among ecology, environment and other sources of obtaining water supply and disposing of sewage.

**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 sketching of piping diagrams; learning how to read and use measuring instruments; ordering tools and materials; and using trade related mathematics. All these skills are integrated using hands-on shop projects.

**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 time since the students are now working more independently. They are also introduced to repair, maintenance, appliances, equipment and practical application of plumbing theory.

**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  
Plumbing Inspector  
Purchasing Agent  
Teacher

Foreman  
Journeyman Plumber/License  
Mechanical Engineer  
Plumbing Estimator  
Project Supervisor  
Sanitary Engineer  
Trade Guide Office

#### **Related Occupations**

Building Maintenance Person  
Hydraulic/Pneumatic Technician  
Pricing Clerk

Gas Company Worker  
Pipefitter  
Sprinkler Fitter

## **PROGRAMMING AND WEB DEVELOPMENT EXPLORATORY**

The Programming and Web Development Exploratory introduces students to the aspects of the information technology and computer science fields. During the exploratory, students will learn how to develop Windows applications using Visual Basic .NET. They will also develop web sites that incorporate graphics and audio using HTML and a web development tool called Microsoft Expressions Web. Video games will be developed using an object-oriented game development engine called Game Maker.

## **PROGRAMMING AND WEB DEVELOPMENT SHOP 1**

In the Programming and Web Development Shop 1 students will continue to develop mastery in the skills of art, science and technology needed to develop video games. The curriculum integrates the rigor and relevance of STEM (science, technology, engineering and mathematics) into fun and exciting classroom projects. Once students have completed the required projects, they will have developed technical proficiency. Students will demonstrate their proficiency by constructing and original designed game. The students' original designed game will incorporate the many competencies developed during the completion of the game development projects. Students will develop the graphic art work for the game's CD case to showcase their game.

## **PROGRAMMING & WEB DEVELOPMENT SHOP 2**

This course 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 video games, web sites and Apps. 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 be introduced to the development, uploading and installation of App on Android platform devices using App development tools.

## **PROGRAMMING & WEB DEVELOPMENT SHOP 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 lead 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.

### **PROGRAMMING & WEB DEVELOPMENT SHOP 3**

This course is designed to further develop student knowledge in the fields of programming and web development attained from Programming and Web Development 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 procedural and object oriented programming structures in the development of their programs. Students will develop programs that demonstrate many of the competencies outlined in the Massachusetts VTE Frameworks 2P develop programs that include the use of arithmetic relational and logical operators, iterative and conditional looping, sort routine, file handling, and arrays algorithms. Students will do this through the development of structures, functions, objects methods and classes. Students will also further explore designing and creating web pages using HTML, JavaScript, Cascading Style Sheet and XML through the use of web development tools. Students will integrate multimedia and video into their projects by utilizing multimedia and graphic tools. Students will publish and maintain websites as they develop them, allowing them to test and follow a quality assurance process. Students will prepare for and take the Microsoft Technology Associates Software Development Fundamentals Certification Exam.

### **PROGRAMMING & WEB DEVELOPMENT 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, the PC Pro certification 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.

### **PROGRAMMING AND WEB DEVELOPMENT SHOP 4**

Programming Shop 4 continues to build on all competencies, skills and knowledge attained in 11<sup>th</sup> grade programming. The program will allow students to begin a co-operative education work study in an Information Technology department at a local company. Cybersecurity introduces the tools and concepts of cybersecurity and encourages students to create solutions that allow people to share computing resources while protecting privacy. Nationally, computational resources are vulnerable and frequently attacked; in Cybersecurity, students solve problems by understanding and closing these vulnerabilities. This course raises students' knowledge of and commitment to ethical computing behavior. It also aims to develop students' skills as consumers, friends, citizens,



and employees who can effectively contribute to communities with a dependable cyber-infrastructure that moves and processes information safely. Students will create a capstone project that showcases all of the major concepts covered in programming, web development, information technology and cybersecurity.

## **PROGRAMMING & WEB DEVELOPMENT 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, the PC Pro certification 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.

### **Career Opportunities in Programming & Web Development:**

#### **Entry Level Occupations**

Computer Technicians	Technical Support/Help Desk
Assistant Network Administrator	Associate Computer Programmer
Video Game Tester	Associate Web Designer/Developer

#### **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

#### **Related Occupations**

Network Administrator	Security Administrator
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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 in order to foster learning and critical thinking. This survey course exposes students to a variety of literature including novels, dramas, short stories, poetry, speeches, and nonfiction texts. This course prepares students for college level work. Purpose and coherence in paragraph and essay development in response to literature and open response prompts are emphasized. The study of a variety of genre emphasizes the development of students' reading, response and analysis skills. 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. Research assignments deepen students understanding of period 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 CP1 is a course designed to increase literacy using a variety of student centered techniques in order to foster learning and critical thinking. 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, literary techniques and author's purpose. There is an emphasis on the development of students' oral and written reading responses and analysis skills. Students' writing style is developed through a variety of writing assignments. Vocabulary is developed through reading strategies and focuses on MCAS and SAT preparation. Independent reading and the use of technology, as well as reference materials, develop students' reading and writing skills through multi-genre projects. 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 college and career. 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. Students analyze the thematic connections found in both classic and contemporary texts. There is also a focus on purpose, coherency, and citing text evidence when writing both literary and informational responses. 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 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 provide both meaning and pleasure. As they read, students 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.

Pre-requisite: Overall average of 90 or better in English II - Honors and English teacher recommendation.

### **ENGLISH 3 - Honors**

The aim of this course is to develop the necessary skills to meet the demands and expectations of typical four-year college courses and focuses on English as a life-long tool for effective communication. 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 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. 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 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.

### **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.

### **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** include the Accuplacer Test, English 3-Honors, a minimum of GPA 2.0, teacher recommendations and parent approval.

### **ENGLISH 4 - Honors**

This course prepares students for college and career level work. Literature continues to be a major focus in this 12<sup>th</sup> grade class. 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, as students study the mechanics of writing, by developing a series of in-depth descriptive, narrative and research papers. Students will utilize the MLA writing conventions for writers of research papers and 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**

This course prepares students for college and career level work. Literature continues to be a major focus in this 12<sup>th</sup> grade class. 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, as students study the mechanics of writing, by developing a series of descriptive, narrative and research papers. Students will utilize the MLA writing conventions for writers of research papers and complete a research project based on a thesis statement related to the themes of the course. The curriculum is aligned with the MA ELA Curriculum Frameworks.

## **MATHEMATICS**

### **ALGEBRA 1 - HONORS**

This is an intense course aligned closely with the Model Algebra 1 Standard prescribed by the Massachusetts Common Core Curriculum. It will cover number and quantity, algebraic expressions, polynomials, rational/irrational numbers, functions, linear, quadratic, and exponential models, and statistics/probability. Daily homework is required.

### **ALGEBRA 1 - CP**

This course focuses on the development of essential math skills. Algebra 1-CP is aligned with the Massachusetts 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.

### **ALGEBRAIC FOUNDATIONS**

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. Algebraic Foundations is aligned with the Massachusetts Common Core Curriculum.

### **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 1 WITH GEOMETRY**

Algebra 1 with Geometry extends the study of linear models and introduces exponential and quadratic models. In addition, students investigate angles, polygons and circles in the plane, as well as transformations of linear functions and shapes in the plane. Students are provided opportunities to discover 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 concepts.

### **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-83 or 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.

### **TRIGONOMETRY – CP**

This course is offered to seniors who have completed Algebra II CP. The content of this course is aligned with the Massachusetts Mathematics Frameworks. The course includes a brief review of key Algebra II concepts that will be required to be successful in Trigonometry. Students will engage in problem solving using various methods of indirect measurement techniques in trigonometry. Concepts are formula and application based with an emphasis on problem solving strategies.

### **FUNCTIONS AND NUMBER SYSTEM**

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.

### **CALCULUS**

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-83 or 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-83 or 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.

### **ALGEBRA 2 APPLICATIONS – CP**

This one semester course focuses on the power standards of the Algebra 2 curriculum. Students will investigate arithmetic and geometric sequences and linear, quadric and exponential functions. (3 credits)

### **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.

### **PROBABILITY AND STATISTICS APPLICATIONS**

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.

## **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, aquatics and health. 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 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, walking and swimming.

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

Carryover activities 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, walking and swimming.

### **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 (fitness, whiffle ball, golf, volleyball, swimming, shuffleboard, bowling, kickball, badminton, weight training, nerf soccer, basketball, country line dancing and games) 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.

### **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.

### **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.

### **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 imp

### **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.

## **WORLD HISTORY - CP**

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 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.

## **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. Topics will include industrialization, immigration, urbanization and the emergence of the United States as a world power. 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.

## **UNITED STATES HISTORY 2 – CP**

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. Topics examined include industrialization, immigration, urbanization and the emergence of the United States as a world power. 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. 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, close reading of fiction and non-fiction texts, study, and organizational skills.

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

The course first reviews the effects of World War II. 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. The Civil Rights Movement and Vietnam War Era are major units of focus. The course encompasses the study of The Truman up to Carter presidencies including the New Frontier and Great Society programs, as well as the Watergate Scandal, domestic foreign affair developments and societal trends.

Students will engage in a variety of writing, research and higher level critical thinking related activities and assignments as well as assessments. 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.

### **UNITED STATES HISTORY 3 – CP**

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.

Students will examine the events and developments within the United States and its role in foreign affairs during the Truman through Carter presidencies. 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.

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.

### **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.

## **ACADEMIC SUPPORT**

### **ENGLISH LANGUAGE LEARNERS - LEVEL 1**

This course provides instruction to limited English proficient students that will improve oral proficiency and understanding of English in order to help them to function in both academic and technical classes. English is spoken in each class in order to develop both receptive and expressive skills. Oral language and pronunciation are emphasized by utilizing written exercises and reading materials. A practical and functional vocabulary is gradually developed which contains common words and expressions used frequently at school and in the

community. In addition, skills for writing clear, complete sentences will be introduced. Language instruction and course texts are aligned with the World-Class Instructional Design and Assessment (WIDA).

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

This course is designed to increase each student's facility with the English language. 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 open response 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 open-ended 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**

In an effort to provide students additional support in English Language Arts, MCAS support and remediation will be offered to those students identified, as not meeting the minimum Needs Improvement Standard on the MCAS exam.

### **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 are utilized to increase student understanding of the key concepts identified in the Massachusetts Learning Standards for Math. Test taking skills will also be emphasized.

### **MATH FOUNDATIONS**

Foundations of Math is provided to eligible students based on ability level and specific learning needs. Foundations of Math 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.