



MINUTEMAN
A REVOLUTION IN LEARNING

Educational Program Plan Labor Market Information Analysis

FINAL

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1. INTRODUCTION

This REVISED Education Program Plan is being submitted to the Department of Elementary and Secondary Education (DESE) for comment and approval. The Minuteman Regional Vocational Technical School District (MRVTSD) has submitted a Preliminary Design Program to the Massachusetts School Building Authority (MSBA) as a required component of our Feasibility Study Agreement. The Feasibility Study agreement expires June 30, 2016 and no further extensions will be granted to the District.

On June 17, 2014, the District School Committee voted a FINAL Design Enrollment of 628 students. The Minuteman Education Program Plan Subcommittee was reconvened in the summer of 2014 and met 4 times to revise the original education program plan submitted in October of 2013. The School Committee held a special meeting on September 10, 2014, during which the Superintendent presented this revised Education Program Plan. The District School Committee voted to accept the revised plan as presented and as recommended by the Education Program Plan Subcommittee. The plan is summarized below:

PROPOSED ACADEMIES AND PROGRAMS/CIP CODES	
Engineering, Construction, and Trades Academy	Life Sciences and Services Academy
Advanced Manufacturing (New) 48.0501 / 48.0599	Biotechnology 15.0401
Robotics Engineering Automation 15.0000 / 15.0403	Environmental Science & Technology 15.0507
Programming & Web Development 11.0201	Horticulture 1.0601
Design & Visual Communications 50.0401	Culinary/Hospitality 12.0500/52.0901
Multi-Media Engineering (New) 09.0701	Health Occupations 51.0000
Carpentry 46.0201	Early Education & Care 13.1210
Electrical 46.0302	Cosmetology/Barbering 12.0404 / 12.0402
Plumbing 46.0503 / 47.0201	
Automotive Technology 47.0604	



2. REVISED EDUCATION PROGRAM RECOMMENDATIONS

- Two programs: Marketing (CIP 19.0203) and Telecommunications/fiber optics (CIP 15.0305) are recommended for closure. Both programs have low levels of member-town enrollment and many of the Telecommunications competencies are addressed in the electrical program.
- Five programs: Barbering (CIP 12.0402), Hospitality (CIP 52.0901), Robotics (CIP 15.0403), Metal Fabrication and Joining Technologies (CIP 48.0599), and HVAC/R (CIP 47.0201) are aligned with or will be assimilated into existing or new programs. These programs have experienced lower than average member town enrollment, less than average career outcomes (job placement, college placement and certifications obtained), and most competencies can be developed in analogous programs (barbering in cosmetology, hospitality in culinary arts, robotics in engineering, welding in advanced manufacturing, and HVAC/R in plumbing).
- The movement towards an Academy Model provides the opportunity to deliver CVTE Core Competencies within clusters of programs inside an Academy rather than in separate programs. This provides a level of efficiency and minimizes duplicative curriculum being offered. We believe this model will also provide for higher level competency attainment by upperclassmen as instruction will be able to focus on specific skills in the later part of the students high school career.
- The administration has proposed opening new programs: Advanced Manufacturing (CIP 48.0501) and Multi-media Engineering (CIP 09.0701) in the Engineering, Construction, and Trades Academy. The Multi-Media Engineering program would operate under the CIP code for Radio and TV Broadcasting. The administration's validation for these programs is supported in the data. Multi-media engineering encompasses the Creative Industries, provides a variety of regional career opportunities and student interest is clear. The opportunities for students in Advanced Manufacturing are well documented in a number of studies. The program of Advanced Manufacturing will prepare students in Machining, Manufacturing, Fabrication and Welding.
- For the Life Sciences and Services Academy, while the overall data suggest that wages in the occupations associated with many of these programs are average, there are attractive career paths in occupations that will remain in demand. Moreover, these programs are among the most popular at Minuteman (as measured by total member-town enrollment), particularly for female students, therefore supporting an overall gender balance.

The District seeks DESE endorsement of this plan as required under the MSBA Feasibility Study agreement. Once initial endorsement has been received, the District will submit closure plans for the identified programs and will initiate a timeline for the approval of two new programs. The determining factor in the timeline for the opening of new programs, is the approval of a building project by all 16 member district communities. That vote is scheduled for town meeting during the spring of 2016.¹

Educational Program Plan and Labor Market Information Analysis

The planning process underway at Minuteman now requires the timely input of DESE. All levels of the Minuteman Community have participated in numerous meetings and work sessions over the past few months and years to develop an educational plan and supporting facility design that will sustain our mission long into the future.

Minuteman acknowledges the work of several key assets:

- The Minuteman Educational Program Plan Subcommittee was formed in the Spring of 2013 with the specific charge to review these data and recommend a final education program plan to the full School Committee in the Fall of 2013. The challenge of proposing a plan for 435 students and 800 students made the process complex. The full school committee voted the original educational program plan October 8, 2013. As noted the District will not approve a school building project based upon a large out of district enrollment. The Education Program Plan Task Force was reconvened in the summer of 2014 to develop a plan for a smaller school.
- Labor Market Works founder, Robert Vinson², reviewed labor market information and provided a comprehensive overview of job outlook projections and wage data in our Career Academies and related occupations.
- The restructuring of the General Advisory Board (GAB) in 2009 has provided a pro-active group of employers and business leaders whose analyses of this data and review of its implications have been integrated into each academy comment section.³
- Program recommendations and implications have been developed through the lens of our “Six Indicators” with the assistance of our General Advisory Board members over the past 5 years.
- Additional meetings, discussions and reviews by workforce education and development professionals within Commonwealth Corporation, The Center for Labor Market Studies at Northeastern University, and the Department of Labor and Workforce Development have provided additional insight into this plan.⁴

This report draws on standard state labor market information sources including: the Massachusetts Employment projections between 2010 and 2020 and the Massachusetts Occupational Wage Survey for Employment and Wages, May, 2012.

Both data sources are produced by the Massachusetts Department of Labor and Workforce Development.⁵ In addition, information from the US Department of Labor⁶, specifically ONET⁷ was used to create the Crosswalk table between, Chapter 74 programs, related occupations, and major industry employers.

Local and regional labor market information was provided by employers serving on Minuteman Advisory Committees, or comes from data published by the Commonwealth Corporation, a quasi-public corporation within the Massachusetts Executive Office of Labor and Workforce Development.



Minuteman Mission

Minuteman collaborates with parents, communities, and business leaders to serve a diverse student body with multiple learning styles. Through a challenging, integrated curriculum our students develop the academic, vocational, and technical skills necessary to be productive members of a global community. We value life-long learning that fosters personal and professional development in a safe and respectful environment. Minuteman is committed to preparing all students for success.

Minuteman Philosophy

Career and Vocational/Technical Education is responsive to the economic needs of the workplace and the individual. By being engaged with employers, business, and post-secondary institutions, the graduates of Minuteman will be better prepared to contribute to the strength of our nation and the quality of life for its citizens. Minuteman recognizes the attainment of skills needed in the global economy is best accomplished through understanding the unique learning styles that lead to performance and individual student success.

Six Indicators of Educational Program Development

As Minuteman's mission prepares individuals for a global economy, it must consider many variables when making adjustments to the type and scope of CVTE programming, including post-secondary program development, while being attentive to M.G.L. Chapter 74 regulations.⁸

Our investments in new programs are based on a review of labor market data including: job growth, living wage data, and student interest. In addition, Minuteman considers emerging technologies and their impact on occupations, other existing training sources outside the district, but available to learners, and the strength (or potential strength) of an industry partner. The partner may be a post-secondary institution, a community based organization, public agency, quasi-public agency, or regional employer. A seventh indicator, student placement, is considered when a program may be eliminated.

1. Job Growth
2. Opportunity for a Living Wage
3. Student Interest
4. The Potential of "Emerging" Occupations/Competencies
5. Existing Training Sources in proximity to the District
6. Presence or Potential of Strategic Industry Partner

While workforce development data (job growth and living wage) are historical in nature, emerging occupations data are projected and require a mixture of research, risk, common sense, and industry advice. Student interest is measured in (historical) enrollment data for existing programs and in student interest survey data. The fifth indicator relates to the availability of similar training programs in the area. This is a significant market factor that is often overlooked when program development decisions are being made. Minuteman reviews the capacity and enrollment trends of similar programs in the region prior to investing. For example, if 8 schools are graduating 12 students per year and the region needs 50 new auto mechanics per year, then the region is training more students than can be

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absorbed by the market. The sixth indicator is the relative strength of an industry partner that seeks to support expansion. No single variable is a final determinant for a program being launched or terminated.

Other “indicators” or variables that are considered by administration when making an investment in a new program include nontraditional student interest as well as the opportunity for public interaction.

Labor Market Overview

The U.S. and Massachusetts labor markets began pulling out of the last recession towards the beginning of 2010. As a result, the employment outlook for Massachusetts and most of the programs offered by Minuteman High School reflect a significant improvement from earlier projections. At the same time, the majority of job openings in the (62.1%) in the Massachusetts economy will result from replacement needs rather than growth.

Between 2010 and 2020, the Massachusetts economy is projected to add 461,725 jobs, a growth rate of 13.7%. While some may view this as an optimistic forecast, the projected rate is significantly higher than the 6.3 % growth rate from the earlier 2006 to 2016 projections. In total, over 1.25 million openings are anticipated during the 2010-2020 projection period.

Post-Graduate Programs

In addition to high school offerings, Minuteman offers post-graduate programs through the Minuteman Technical Institute (MTI). Most programs are 1-2 years in length with sessions beginning in September and February.⁹ The following PG Programs are offered through MTI, on site during the day in dedicated shop spaces: Automotive Technology, Building Construction Technology (Carpentry), Cosmetology, Dental Assisting, and Bio-Manufacturing. Automotive and Building Construction Technology are offered in cooperation with Middlesex Community College and provide Associate Degree opportunities to post-grad students.

Other opportunities for post-graduate students are provided on a space available basis in Electrical Wiring, Heating/Ventilation/Air Conditioning/Refrigeration, Plumbing, Culinary Arts/Baking/Hospitality Management, and Horticulture & Landscape Technology.

A significant concern has arisen in the MSBA process and regulation regarding Post Graduate Education. Simply put, MSBA WILL NOT participate in Chapter 74 approved post-graduate facility development. Even though DESE includes these PG students in their mission of delivering high quality CVTE in the Commonwealth, the agency created to support the construction of CVTE learning environments, has no authority or obligation to work with any School District in providing this much needed training.



3. EXECUTIVE SUMMARY: LABOR MARKET INFORMATION ANALYSIS

- The Labor Market Information Analysis, conducted for the Minuteman Regional Vocational Technical School District (MRVTSD) reviewed each of the Chapter 74 programs within the existing three (3) Clusters: Trades and Transportation, Bioscience and Engineering, and Human, Business and Commercial Services. The analyses also included the PROPOSED Chapter 74 programs in the PROPOSED two (2) Career Academies: The Engineering, Construction, and Trades Academy and Life Sciences and Services Academy. The Summary is organized by the TWO PROPOSED Career Academies.
- The principal data sources included the Massachusetts Occupational Employment Projections, 2010-2020, and Occupational Wage Survey, May 2012, produced by the Massachusetts Department of Labor and Workforce Development. In addition, the Industry Occupation Matrix and O*NET from the US Department of Labor were also integral to the analysis. O*NET is the career information and job analysis tool that replaced the Dictionary of Occupational Titles (DOT).
- There are more than 60 specific industries related to existing and proposed Chapter 74 Programs offered by MRVTSD.
- While the labor market outlook for most of the Chapter 74 programs is positive, there is a wide variation across programs and related occupations. The variations are related to the size of specific occupations, projected growth rates, the total number of annual openings and the importance of openings due to growth or replacement. Perhaps most significantly is the large variation in both entry level and median annual wages.



A. Engineering, Construction, and Trades Academy

- Most of the occupations in this academy are characterized by moderate growth rates, with openings due primarily to replacement. Plumbers, Electricians and Heating Ventilation Air Conditioning Mechanics (HVAC/R) are among those occupations with the largest number of projected openings.
- An exception within this academy occurs among Automotive Service Technicians and Carpenters. There is very little growth anticipated for these two occupations, but due to their size, they have the largest number of projected openings. Almost all of the openings will be due to replacement.
- A positive feature of this academy is the 2012 entry level wages, with Carpenters at \$36,180, Telecommunications Equipment Installers at \$38,980, HVAC Mechanics at \$39,180, Electricians at \$41,110, and Plumbers at \$42,630.
- In the Programming and Web Design area, the labor market outlook for the three occupations related to Computer Programming is quite positive. Computer Support Specialists are expected to add just over 4,000 jobs during the projection period, followed by Other Computer Specialists, such as Information Security Analyst and Web Designers (2,751 jobs) and Computer Programmers (1,255 jobs). Each IT course offered at Minuteman will include knowledge of security checks and processes
- Another positive aspect of the above occupations is the wages. Other Computer Specialists (Information Security Analyst and Web Designers) reported the highest entry level wages (\$61,220), followed by Computer Programmers (\$52,750) and Computer Support Specialists (\$38,680).
- Within Design and Visual Communication, Graphic Designers are projected to add 1,221 jobs which translate to 360 annual openings. The entry level wage for this occupation is \$36,120.
- The largest of the six occupations related to Multi-Media Engineering, Audio and Video Technicians, is expected to add nearly 600 jobs over the projection period, while the second largest, Multi-Media Artists, is anticipating an increase of 218 jobs. All of the remaining occupations including Set Designers, Sound and Engineering Technicians, and Camera and Video Operators, are expected to add fewer than 100 jobs over the projections period. The exception is Film and Video Editors, with 121 jobs. Among the six occupations related to Entertainment Engineering, entry level wages range from \$24,300 (Sound Engineering Technicians) to \$41,850 (Multi-Media Artists). (See Updated Multi-Media Engineering Data on Page 22.)
- The three occupations related to Robotics and Automation include Manufacturing Production Technicians, Mechanical Engineering Technicians and Electro-Mechanical Technicians. These occupations are projected to grow slightly below the statewide rate of 13.7%. As these occupations are also small, fewer than 50 annual openings are expected.

- Three of the five occupations related to Engineering are expected to grow slowly. However, the biggest occupation, Electrical and Electronic Technicians, is projected to add 558 jobs, with almost 200 annual openings.
- While the growth prospects for the occupations in this academy are modest, the wages are a draw for program graduates. Entry level wages for the two Technician occupations range from \$41,370 (Mechanical Engineering Technicians) to \$42,450 (Electrical and Electronic Technicians).



B. Life Sciences and Services Academy

- The labor market outlook for the six occupations related to Bioscience and Bio-Manufacturing is quite bright. The growth rate for each occupation exceeds the state wide average of 13.7%. The largest occupation, Biological Technicians, is expected to add nearly 1,100 jobs, with 278 annual openings. The three occupations related to Bio Manufacturing (Medical Equipment Repairers, Medical Equipment Preparers and Medical Appliance Technicians), though small, have among the fastest projected growth rates for all occupations.
- The wages for occupations in this group are also attractive. Entry level wages for the five Technician and Repair occupations range from just under \$30,000 to \$35,460. The highest entry wage is for Biological Scientists at \$61,640. This occupation, however, requires at least a Bachelor's Degree.
- The dominant occupation within Horticulture and Landscaping is Landscapers and Groundskeepers. It is one of the Commonwealth's largest occupations with a projected employment increase of nearly 6,000 jobs. This translates to over 1,000 annual openings. The wages, however, are quite modest with entry level wages of \$23,520 and a median wage of \$31,440. The wages reflect in part the seasonal nature of landscaping and grounds keeping work.
- The growth rate for three of the four Environmental Technology occupations (Environmental Engineering Technicians, Environmental Science and Protection Technicians, and Hazardous Waste Removal Workers) is expected to grow faster than the Commonwealth, as a whole. These are small occupations, however, with the range of annual openings being between 30 and 70.
- Entry lever wages range for the above occupations range from \$28,080 (Environmental Science and Protection Technicians) to \$35,100 for Environmental Engineering Technicians. It should be noted that these two occupations typically require an Associate's Degree.
- Health Assisting, Cosmetology and Early Childhood Education are the three programs with the most absolute openings in related occupations. Among specific occupations with large numbers of openings (exceeding 1,000 annually) are Child Care Workers, Nurse's Aides, Personal /Home Care Aides and Home Health Aides. In addition, Hairdressers and Cosmetologists is also an occupation with a large number of openings, approaching 800 annually.
- The wages for some occupations in this academy are modest, at best. Median Wages for the three Aide and Cosmetologist occupations were less than \$29,000 while the median wage for Child Care Workers was under \$25,000. One notable exception was Kindergarten Teachers with a median wage above \$60,000.
- Culinary Arts occupations were characterized by below average growth and low entry wages. In fact, two occupations (Chef's and Head Cooks, and Fast Food Cooks) were actually expected to decline. Job openings will exist and be due primarily to replacement. The one occupation with an above average growth rate was Institution and Cafeteria Cooks.



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- Most of the Culinary occupations reported entry level wages between \$17,000 and \$20,000, and median wages between \$19,000 and \$30,000. The one exception was Chefs and Head cooks with an entry wage of \$37,820.
- Modest growth was also projected for most occupations related to Hospitality and Tourism with entry level wages running between \$19,430 (Hotel and Desk Clerks) and Travel Agents (\$28,670). Minuteman's program trains students in the many fields of Hospitality and Tourism as well as prepares them for further education.
- The notable exception in the Hospitality field was Meeting and Convention Planners. This occupation has rapid projected growth (53.5%), the largest number of annual openings (nearly 1,100), and an entry level wage of \$37,680.



4. INDUSTRIES AND OCCUPATIONS RELATED TO CHAPTER 74 PROGRAMS

A list of detailed industries related to at least one Chapter 74 Program is presented in Table A, shown in the Appendix. As the list indicates, there are more than 60 detailed industries relevant to programs offered by Minuteman range of industries relevant to these programs. The industries included in Table A provide a framework for connecting industries related to Minuteman programs with local employers.

The difference between industries and occupations is that industries are where people work and occupations are what people do. To amplify the relationship between specific programs, related occupations and key industries, a cross reference between each of the Chapter 74 programs offered by Minuteman is presented in Table B, shown in the Appendix. This crosswalk is especially important, since many instructional programs typically prepare students for more than one occupation,

There are essentially two distinct groups of Chapter 74 programs included in Appendix Table B. The first group consists of programs where there is a direct connection to one or two specific occupations and a small number of key industries. This group of programs would include as examples Construction Trades, Early Childhood Education, and Cosmetology. The labor market advantage of programs in this group is that it is easier to identify specific employers and potential employment opportunities. The disadvantage is that if the key industries are experiencing labor market difficulties, job placement opportunities can quickly become limited.

Many of remaining programs, particularly Multi-Media Engineering, are characterized as having a number of different occupational entry points and a much larger array of industries that are related to the programs. The labor market advantage of these programs is there are a wider set of occupations and industries that might potentially need new graduates. Furthermore, if one or two key industries are experiencing labor market difficulties there are likely to be placement opportunities in other related industries. The disadvantage is that program staff will need to work with a much larger and broader employer network than for those programs with more direct occupational and industry connections.

The Health Assisting and Culinary Arts programs share features of both groups. While Health Assisting graduates will be able to focus on a relatively small group of Health related industries, there are a number of potentially different occupational entry points as indicated in Table B. With regard to Culinary Arts, there are a number of variations with regard to occupational options (e.g. Chefs, Institutional Cooks, and Short-Order Cooks, etc.), but a narrow set of industries associated with Hospitality that would potentially hire graduates from a Culinary Arts program.

5. EMPLOYMENT PROJECTIONS AND WAGE SUMMARIES

A. Engineering, Construction, and Trades Academy

1. Occupational Employment Projections Summary 2010-2020

Table 1 and Table 2 provide employment projections for the Engineering, Construction, and Trades Academy. The overall employment change and the annual number of openings due to both growth and replacement are included in Table 1. Information pertaining to the projected growth and the share of openings related to growth and replacement are included in Table 2.

TABLE 1 MASSACHUSETTS EMPLOYMENT PROJECTIONS 2010-2020 ENGINEERING CONSTRUCTION & TRADES OCCUPATIONS				
Description	Employment Change 2010-2020	Annual New openings	Annual Replacement	Annual Total Openings
Automotive Service Technicians	622	62	451	513
Carpenters	280	28	451	479
Plumbers & Pipefitters	1,170	117	291	408
Electricians	1,264	126	311	437
Telecommunications Equipment Installers	513	51	58	109
Security and Alarm Installers	318	32	36	68
HVAC Mechanics & Installers	994	99	136	235
Valve and Control Installers	-17	0	18	18
Helpers, Carpenters	276	28	26	54
Helpers, Plumbers	134	13	12	25
Helpers, Electricians	232	23	41	64
Sheet Metal Workers	188	19	30	49
Structural Metal Workers	268	27	23	50
Welders, Cutters, Soldering	479	48	69	117
TOTAL, ALL OCCUPATIONS	461,725	46,170	78,909	125,079

The overall outlook for this academy is much improved from earlier projections. This likely reflects an improvement in the economy and specifically the private and commercial real estate and housing markets. As Table 1 indicates, the projected employment change is most pronounced for Electricians (1,264), Plumbers and Pipefitters (1,170) and HVAC Mechanics (994). A slightly different



picture emerges with regard to annual job openings. Among the Construction Trade occupations, Carpenters has the most projected annual openings (479), followed by Electricians (437), Plumbers and Pipefitters (408) and HVAC Mechanics (235). While Carpenter has a minimal growth rate (1.3%), it is the largest Trade occupation which accounts for it having the most openings. It should be noted that the projected openings for Construction are due almost entirely to replacement.

TABLE 2 MASSACHUSETTS EMPLOYMENT PROJECTIONS 2010-2020 ENGINEERING CONSTRUCTION & TRADES OCCUPATIONS			
Description	Percent Employment Change 2010-2020	Percent Openings Due To Growth	Percent Openings Due Replacement
Automotive Service Technicians	3.6	12.1	87.9
Carpenters	1.3	5.8	94.2
Plumbers & Pipefitters	11.6	28.7	71.3
Electricians	11.0	28.9	71.1
Telecommunications Equipment Installers	13.9	46.8	53.2
Security and Alarm Installers	21.7	47.1	52.9
HVAC Mechanics & Installers	12.9	42.1	57.9
Valve and Control Installers	-7.9	0	100.0
Helpers, Carpenters	27.7	51.9	48.1
Helpers, Plumbers	28.5	52.0	48.0
Helpers, Electricians	14.9	36.0	64.0
Sheet Metal Workers	10.5	38.8	61.2
Structural Metal Workers	27.4	54.0	46.0
Welders, Cutters, Soldering	18.6	41.0	59.0
TOTAL, ALL OCCUPATIONS	13.7	37.9	62.1

A closer look at Table 2 indicates that with the exception of Carpenters, most of the Trade occupations, including Sheet Metal workers and Welders, are near the overall projected growth rate of 13.7% for the entire Massachusetts economy. However, there are several smaller occupations with growth rate well in excess of the statewide rate including Helpers for both Plumbers (28.5%) and Carpenters (37.7%). In addition, Structural Metal Workers (27.4%) and Security and Alarm Installers (21.7%) are projected to grow much faster than the state. Conversely, the one occupation expected to decline is Valve and Control Installers. This may due in part that Valve and Control Installation is becoming a skill imbedded in other occupations such as HVAC mechanics rather than functioning as a discreet occupation.



Automotive Service Technicians have an employment outlook that is very similar to Carpenters. The projected growth rate is quite small (3.6% but this occupation has the largest number of projected openings (513) in the academy. Automotive Service Technicians is the second largest occupation, which accounts for the large number of openings.

The skills needed for this occupation are constantly evolving. Increased specialization along with a greater emphasis on electronics has heightened the importance of proper training. Individuals certified in multiple specialties such as engine repair, electrical systems, and brake systems will be seen as most desirable by prospective employers. Furthermore, nearly one-third of all Auto Service Technicians between the ages of 25-44 have some post-secondary education, with many holding an Associate's Degree.

The labor market outlook for the three occupations that are associated with Computer Programming and Web Design (Table 3) are quite positive. Computer Support Specialists, the largest occupation in the group is projected to increase employment by over 4,000 jobs or 21.0 percent. This translates into 910 annual openings, with 405 related to growth. Another Computer Specialist occupation, Information Security and Web Design, is the fastest growing occupation with employment expected to increase by 29.9%, representing an employment increase of 2,751 jobs. Annual openings for this occupation will total 411, with two thirds of the openings related to growth. The third occupation, Computer Programmers has a growth rate similar to the state (13.5%), with employment expanding by 1,255 jobs. A total of 342 annual openings are anticipated, with the majority related to replacement.

The outlook for Graphics Designers (which includes Video Games), shown in Table 4, is comparable to the state as whole. During the projections period, Graphic Designers are expected to grow by 15.9%, an increase of 1,221 jobs representing 360 annual openings. Most of the projected openings (238) are due to replacement. The growth rate for Commercial and Industrial Designers (19.5%) represents an employment increase of 148 jobs and 46 annual openings.

Employment Projections and Wage Data related to Multi-Media Engineering listed in Tables 4, 6, and 10 have been updated for the years 2014-2024, and can be found in Table 10A.

The projected growth rates for the three occupations related to Robotics and Automation Technology (Table 5), Manufacturing Productions Technicians (11.6%), Mechanical Engineering Technicians (11.3%) and Electro-Mechanical Technicians (10.3%) are all slightly below the statewide growth rate of 13.7%. The respective increases in employment are 97, 172, and 125. As these occupations are small, fewer than 50 annual openings are available for each occupation. It appears that productivity gains associated with automation and improved manufacturing processes, including the use of robotics, will to a large extent limit the demand for these occupations. If however, the application of robotics technology moves further into areas that are related to human safety, such as drones or debris and hazardous materials removal, the outlook could improve.



With the exception of Telecommunications Installers (13.9%), the remaining occupations related to Engineering Technology are all expected to fall below the statewide growth rate, as shown in Table 6. The largest occupation, Electrical and Electronic occupations while anticipating modest growth (7.9%) it is expected to add 558 jobs over the projections period, representing almost 200 annual openings. The number of Telecommunications Installers is expected to grow by 513 jobs, with a little over 100 annual openings. The Computer and Office Machine repairers are expected to add 133 jobs as compared to just 42 for Home Equipment Installers.

TABLE 3 MASSACHUSETTS EMPLOYMENT PROJECTIONS 2010-2020 ENGINEERING CONSTRUCTION & TRADES OCCUPATIONS				
Description	Employment Change 2010-2020	Annual New Openings	Annual Replacement	Annual Total Openings
PROGRAMMING AND WEB DESIGN				
Computer Programmers	1,255	126	216	342
Computer Support Specialists	4,047	405	505	910
Information Security and Web Design	2,751	275	136	411

TABLE 4 MASSACHUSETTS EMPLOYMENT PROJECTIONS 2010-2020 ENGINEERING CONSTRUCTION & TRADES OCCUPATIONS				
Description	Employment Change 2010-2020	Annual New Openings	Annual Replacement	Annual Total Openings
DESIGN AND VISUAL COMMUNICATION				
Graphic Designers (including Video Games)	1,221	122	238	360
Commercial and Industrial Designer	148	15	31	46
ENTERTAINMENT TECHNOLOGY				
Set and Exhibit Designers	74	7	10	17
Multi-media Artists	218	22	44	66
Audio and Video Technicians	579	58	73	131
Film and Video Editors	121	12	11	23
Camera and Video Operators	50	5	12	17
Sound Engineering Technicians	73	7	13	20



TABLE 5 MASSACHUSETTS EMPLOYMENT PROJECTIONS 2010-2020 ENGINEERING CONSTRUCTION & TRADES OCCUPATIONS				
Description	Employment Change 2010-2020	Annual New Openings	Annual Replacement	Annual Total Openings
ROBOTICS AND AUTOMATIC TECHNOLOGY				
Electro-Mechanical Technicians	125	12	23	35
Mechanical Engineering Technicians	172	17	29	46
Manufacturing Production Technicians	97	10	16	26
ENGINEERING TECHNOLOGY				
Electrical and Electronic Technicians	558	56	134	190
Home Entertainment Installers	42	4	24	28
Telecommunications Installers	513	51	58	109
Computer and Office Machine Repairers	133	13	76	89

TABLE 6 MASSACHUSETTS EMPLOYMENT PROJECTIONS 2020-2020 ENGINEERING CONSTRUCTION & TRADES OCCUPATIONS			
Description	Percent Employment Change 2010-2020	Percent Openings Due To Growth	Percent Openings Due Replacement
PROGRAMMING AND WEB DESIGN			
Computer Programmers	13.5	36.8	63.2
Computer Support Specialists	21.0	44.5	55.5
Information Security and Web design	29.9	67.0	33.0
DESIGN AND VISUAL COMMUNICATION			
Graphic Designers (includes Video Games)	15.9	33.9	66.1
Commercial and Industrial Designers	19.5	32.6	67.4
MULTI-MEDIA ENGINEERING			
Set and Exhibit Designers	22.0	41.1	58.9
Multi-Media Artists	11.9	33.3	66.7
Audio and Video Technicians	22.6	44.3	55.7
Film and Video Editors	20.3	52.2	4.8
Camera and Video Operators	7.9	29.4	70.6
Sound Technicians	15.6	35.0	65.0
ROBOTICS ENGINEERING AUTOMATION			
Electro-Mechanical Technicians	10.3	34.3	65.7
Mechanical Engineering Technicians	11.3	37.0	63.0
Manufacturing Production Technicians	11.6	38.5	61.5
Electrical and Electronic Technicians	7.9	29.5	70.5
Home Entertainment Installers	4.2	14.3	85.7
Telecommunications Installers	13.9	46.8	54.2
Computer and Office Machine Repairers	4.3	14.6	85.4
TOTAL, ALL OCCUPATIONS	13.7	37.9	62.1



A. Engineering, Construction, and Trades Academy

2. Employment and Wage Summary May 2012

The following summary pertains to employment and wages for Carpentry, Plumbing, Welding, HVAC/R, Automotive Technology, and Electrical. Both the Entry Level and Median Annual Wages are included in Table 7.

Note: Currently, many of Minuteman’s students in the Trades enter into the Union (State-wide Articulation with the Carpenters Union), or an Apprenticeship Program (HVAC, Plumbing, and Electrical) upon graduation.

TABLE 7 MASSACHUSETTS EMPLOYMENT LEVELS AND WAGES ENGINEERING CONSTRUCTION & TRADES OCCUPATIONS			
Occupation	Projected Employment Level—2020	Entry Annual Wage May 2012	Median Annual Wage May 2012
Automotive Service Technicians	18,056	\$28,110	\$41,110
Carpenters	21,558	\$36,180	\$53,360
Plumbers & Pipefitters	11,247	\$42,630	\$62,790
Electricians	12,790	\$41,110	\$59,420
Telecommunications Equipment Installers	8,477	\$38,980	\$61,700
Security and Alarm Installers	1,787	\$38,290	\$52,130
HVAC Mechanics & Installers	8,690	\$39,180	\$56,290
Valve and Control Installers	877	\$38,760	\$60,450
Helpers, Carpenters	1,273	\$27,220	\$35,550
Helpers, Plumbers	605	\$17,590	\$28,840
Helpers, Electricians	1,794	\$24,900	\$33,230
Sheet Metal Workers	1,985	\$32,460	\$57,050
Structural Metal Workers	1,463	\$29,360	\$40,950
Welders, Cutters, Soldering	3,054	\$31,290	\$43,840

With the exception of the Helper occupations and Structural Metal Workers, all of the Construction Trade occupations have entry level wages exceeding \$30,000 with most of the occupations exceeding \$36,000. At the very top of this group are Plumbers and Pipefitters (\$42,630), Electricians, (\$41,110) and HVAC Mechanics (\$39,180). A review of the median annual wage reveals a similar relationship. The majority of the occupations in this academy exceed \$52,000, with Plumbers and Pipefitters (\$62,790) and Telecommunication Equipment Installers (\$61,700) leading the way.



The entry level wages for Structural Metal Workers was \$29,360, while for Welders it was \$31,290. The respective median wages were \$40,950 and \$43,840. Among the Helper occupations, Carpenters had the highest entry wage (\$27,220) followed by Electricians (\$24,900) and Plumbers (\$17,590). The median wage for Carpenter Helpers was \$35,550, with Electrician Helper (\$33,320) slightly behind. The median wage for Plumber Helpers was \$28,840. With regard to Automotive Service Technicians, the entry level wage was \$28,110 as compared to the median wage of \$41,110. It is likely that those Technicians with multiple specialties and certifications will command higher wages. Tables 8 through 27 provide employment projections information for the Programming and Web Design, Design and Visual Communication, Entertainment Technology, and Robotics Engineering Automation Programs.

Although the labor market outlook for Engineering Technology program graduates is mixed, the wages remain an attractive feature, especially for the Computer Programming and Web Design occupations (Table 8). The entry level wage for Other Computer Specialists (Information Security and Web Designers) is \$61,220, followed by Computer Programmers (\$52,750) and Computer Support Specialists (\$38,680). The median wage of \$88,360 for Information Security and Web Designers is the highest of all occupations in the entire Engineering Technology Academy. The median wages for both Computer Programmers (\$76,270) and Computer Support Specialists (\$56,580) are also well paying.

All of the Technician occupations related to both Robotics and Engineering Technician occupations (Table 9) have entry level wages that exceed \$37,000, with Electronic Technicians (\$42,450) and Electro-Mechanical Technicians (\$41,370) at the top. With regard to median wages, all but Mechanical Engineering Technicians exceed \$55,000. At the top end are Telecommunications Equipment Installers and Repairers (\$61,780). The entry level wages for Home Entertainment Installers (\$25,310) and Computer and Office Machine repairers (\$28,690) are at the lower end of this queue. The respective median wages are \$47,780 and \$44,830.

TABLE 8 MASSACHUSETTS EMPLOYMENT LEVELS AND WAGES ENGINEERING CONSTRUCTION & TRADES OCCUPATIONS			
Description	Projected Employment Level - 2020	Entry Annual Wage May 2012	Median Annual Wage May 2012
PROGRAMMING AND WEB DESIGN			
Computer Programmers	10,552	\$52,750	\$76,270
Computer Support Specialists	23,289	\$38,680	\$56,580
Information Security and Web Design	11,950	\$61,220	\$88,360



TABLE 9 MASSACHUSETTS EMPLOYMENT PROJECTIONS 2010-2020 ENGINEERING CONSTRUCTION & TRADES OCCUPATIONS			
Description	Projected Employment Level - 2020	Entry Annual Wage May 2012	Median Annual Wage May 2012
ROBOTICS ENGINEERING AUTOMATION			
Electro-Mechanical Technicians	1,340	\$41,370	\$55,000
Mechanical Engineering Technicians	1,697	\$37,520	\$51,550
Manufacturing Production Technicians	935	\$39,920	\$57,680
Electrical and Electronic Technicians	7,592	\$42,450	\$56,890
Home Entertainment Installers	1,040	\$25,310	\$47,780
Telecommunications Installers	4,155	\$38,890	\$61,780
Computer and Office Machine Repairers	3,220	\$28,690	\$44,830

The very large Graphics Designer occupation (Table 10) reported an entry level wage of \$36,120 and a median wage of \$50,410. Among the remaining occupations in the Design and Multi-Media Engineering programs, Commercial Designers was at the top, with a median wage of \$65,710 followed by Multi-Media Artists (\$62,460). Set Designers and Film and Video Editors both had median wages in excess of \$58,100. The remaining occupations reported median wages for Audio and Video Technicians (\$47,170), Sound Engineering Technicians (\$40,010) and Camera and Video Operators (\$37,920). At the entry level, wages ranged from a low of \$24,300 for Sound Engineering Technicians to a high of \$43,800 for Commercial and Industrial Designers. Updated wage information for Multi-Media Engineering is found in Section 3 below.

TABLE 10 MASSACHUSETTS EMPLOYMENT PROJECTIONS 2010-2020 ENGINEERING CONSTRUCTION & TRADES OCCUPATIONS			
Description	Projected Employment Level - 2020	Entry Annual Wage May 2012	Median Annual Wage May 2012
DESIGN AND VISUAL COMMUNICATION			
Graphic Designers (including Video Games)	8,892	\$36,120	\$50,410
Commercial and Industrial Designer	1,157	\$43,800	\$65,710
MULTI-MEDIA ENGINEERING			
Set and Exhibit Designers	411	\$33,740	\$58,920
Multi-media Artists	2,055	\$41,850	\$62,460
Audio and Video Technicians	3,137	\$33,710	\$47,140
Film and Video Editors	715	\$34,790	\$58,010
Camera and Video Operators	684	\$27,720	\$37,920
Sound Engineering Technicians	540	\$24,300	\$40,010



A. Engineering, Construction, and Trades Academy

3. Multi-Media Engineering Data 2014-2024 (updated 3.2.17)

As Table 10A indicates, positive growth is anticipated for all of the occupations related to Multi-Media Engineering, except Broadcast Technicians, during the 2014-2024 projections period. In addition, eight of the eleven occupations are projected to meet or exceed the overall statewide growth rate of 5.7%. The growth prospects for Web Developers appear especially promising, with a growth rate of 20.1%, representing 1,620 openings. Web Developers have both the fastest growth rate, as well as the largest number of openings, including over 1,000 related to growth. Film and Video Editors, although a small occupation, has the second fastest projected growth rate (15.0%), followed by the much larger Audio and Video Equipment Operators (11.4%), with 600 total openings expected over the projections period.

Another occupation with a solid outlook is Meeting and Convention Planning. The projected growth rate of 8.7% is well above the statewide average and 530 openings with 230 related to growth are anticipated over the projections period.

Among the remaining occupations in this cluster, with both a significant number of openings and also exceeding the statewide growth rate, are Producers and Directors (1,100 openings) and Technical Writers (680 openings). Multi-Media Artists, although growing more slowly than the state, is expected to generate 380 openings over this period.

The wages in the Multi-Media Engineering Cluster are also an attractive feature. According to Mean Wage information from May 2015, six of the eleven occupations exceed the statewide average of \$59,010, including Technical Writers (\$82,480), Web Developers (\$78,470), Multi Media Artist (\$74,440), Producers and Directors (\$70,400), Sound Engineering Technicians (\$61,780), and Meeting and Convention Planners (\$60,680). The five remaining occupations all fall within a range of between \$46,320 and \$52,420.



**TABLE 10A
 MASSACHUSETTS EMPLOYMENT PROJECTIONS
 Growth, Openings, Mean Wage Data (updated 3.2.17)
 Multi-Media Engineering
 2014-2024**

Description	Growth Rate	Total Openings Growth	Total Openings Replacement	Total Openings	Mean Wage May 2016
Web Developers	20.1%	1,020	600	1,620	\$78,470
Film and Video Editors	15.0%	100	50	150	\$50,100
Audio and Video Equipment Technicians	11.4%	220	380	600	\$46,320
Meeting and Convention Planners	8.7%	230	300	530	\$60,860
Sound Engineering Technicians	7.2%	20	60	80	\$61,780
Set and Exhibit Designers	6.9%	10	40	50	\$49,950
Technical Writers	6.6%	160	520	680	\$82,480
Producers and Directors	6.0%	180	920	1,100	\$70,400
Camera Operators—Video and Motion Pictures	3.7%	20	50	70	\$52,420
Multi Media Artists	2.3%	40	340	380	\$74,440
Broadcast Technicians	-1.8%	0	140	140	\$49,800
TOTAL, ALL OCCUPATIONS	5.7%				\$59,010

The projections and wage data for the Multi-Media Engineering Educational Program clearly support a rationale for the Multi-Media Engineering Program and the related occupations. There are multiple options for students to both obtain and enhance their skills, including advanced technical school training,



apprenticeship programs, and on-the-job training through the Minuteman work study program. Many workers in the Multi-Media Engineering field have an Associate's Degree, but individuals can often substitute on-the-job training for education, and gain experience by working with individuals already in the field.

Hands-on opportunities for learning outside the classroom are especially important for occupations in the Multi-Media Engineering Cluster. Internships and coop opportunities for Audio, Video and Sound Technicians in local cable companies and radio stations can be invaluable for both advancing skills and leading to job opportunities upon graduation. In a similar fashion, internships and coop positions among employers of software publishers, computer systems design, and advertising companies can also assist students looking for occupational entry as Web Developers, Technical Writers, and Multi-Media Artists.

While Meeting and Convention Planners may initially appear outside the realm of this program cluster, there was strong support from the Advisory Committee. The need for both multi-media and organizational skills in planning corporate meeting and training events, as well as large conventions, is becoming increasingly important. Finding internships and coop experiences under the direction of individuals experienced in planning and organizing meetings and events can help students gain access to this growing field.



B. Life Sciences and Services Academy

1. Occupational Employment Projections Summary 2010-2020

Tables 11 through Table 14 provide employment projections for the Chapter 74 Programs related to Life Sciences and Services. These programs include Bio-Technology, Bio-Manufacturing, Horticulture and Landscaping, and Environmental Science and Technology.

The labor market outlook for the six occupations related to Bio –Technology is quite bright (Table 11). While most of these occupations are small with the exception of Biological Technicians, the growth rates for all six occupations exceed the state wide average. The occupation with the most absolute growth is Biological Technicians, which is expected to expand by nearly 1,100 jobs, with total annual openings of 278. The Chemical Technician occupation is expected to add 470 jobs over the projection period, with 81 annual openings. Biological Scientists, which is the smallest of the Bio-Tech occupations, should add fewer than 200 jobs over the projection period, representing 44 annual openings. It should be noted that Biological Scientists are required to have at a minimum an advanced degree, and more often a graduate degree.

Employment opportunities will be concentrated in the Life Science industries, including Pharmaceutical and Scientific Research firms. Maintaining and expanding local employer relationships is essential. This is especially true since most Life Sciences employers typically look for individuals with a Bachelor’s degree. The future prospects for graduates of this program are very positive in the Route 128 corridor.

Although small, the three occupations related to Bio Manufacturing are projected to grow much faster than the statewide average. The labor market picture for graduates from Medical Equipment Repairers is also bright with a projected growth rate of nearly 40%, an increase of 328 jobs over the projections period. Individuals employed in this occupation inspect, test and repair medical equipment should find openings due to both growth (33) and replacement (24). Medical Appliance Technicians who fit and repair braces, supports and prosthesis is one of the fastest growing occupations, increasing employment by almost 50% and adding 356 jobs. Medical Equipment Preparers (different than Repairers), clean instruments and detect equipment leaks and loose parts is expected to grow by nearly 20% and add just over 214 jobs.

Among the occupations related to Horticulture and Landscaping (Table 12), the largest occupation by far is Landscapers and Groundskeeper. In fact, it is one of the largest occupations in the entire Massachusetts economy. During the projections period, nearly 6,000 jobs are expected to be added, representing a growth rate of almost 25%. A total of just over 1,000 openings are expected annually, with the majority due to growth. Pest Control Workers was projected to add 264 jobs, representing a growth rate of just fewer than 30%. This translates to 66 annual openings.



The outlook for the two remaining occupations related to Horticulture and Landscaping is much less favorable. Employment among Florist is expected to decline while for Nursery and Greenhouse Workers it is unchanged. There will however, be a small number of replacement openings for both Florists (45) and Nursery Workers (74).

Among the four occupations related to Environmental Science, Environmental Engineering Technicians and Environmental Science and Protection Technicians often require an Associate's Degree. By comparison, Hazardous Waste Removal Workers and Water and Waste Treatment Operators can obtain entry level positions with vocational training or post-secondary education below the Associate's Degree.

The growth rate for three of the Environmental Technology-related occupations (Table 13 and 14) exceeds the overall average for Massachusetts. Projected growth for Environmental Engineering Technicians (27.9%) and Environmental Science and Protection Technicians (21.5%) is especially positive. A total of 180 and 204 jobs, respectively, will be added during the projections period. This translates into 30 and 60 annual job openings for these two occupations. Hazardous Waste Removal workers are expected to increase employment by 301 jobs, for a growth rate of almost 20%, resulting in 70 annual openings.

The one occupation with a negative outlook is Water and Waste Treatment Operators. Employment is projected to decline slightly (-11 jobs) but 63 annual openings are anticipated to meet replacement needs.



TABLE 11 MASSACHUSETTS EMPLOYMENT PROJECTIONS 2010-2020 LIFE SCIENCES AND SERVICES OCCUPATIONS				
Description	Employment Change 2010-2020	Annual New Openings	Replacement Openings	Annual Total Openings
BIO-TECHNOLOGY				
Biological Scientists	194	19	25	44
Biological Technicians	1,062	106	172	278
Chemical Technicians	470	47	34	81
BIO-MANUFACTURING				
Medical Appliance Technicians	356	36	22	58
Medical Equipment Preparers	214	21	17	38
Medical Equipment Repairers	328	33	24	57

TABLE 12 MASSACHUSETTS EMPLOYMENT PROJECTIONS 2010-2020 LIFE SCIENCES AND SERVICES OCCUPATIONS				
Description	Employment Change 2010-2020	Annual New Openings	Replacement Openings	Annual Total Openings
HORTICULTURE AND LANDSCAPING				
Landscapers and Groundskeepers	5,931	593	445	1,038
Pest Control Workers	264	26	40	66
Nursery/Greenhouse Workers	0	0	74	74
Florists	-231	0	45	45



**TABLE 13
MASSACHUSETTS EMPLOYMENT PROJECTIONS
2010-2020
LIFE SCIENCES AND SERVICES OCCUPATIONS**

Description	Employment Change 2010-2020	Annual New Openings	Replacement Openings	Annual Total Openings
ENVIRONMENTAL TECHNOLOGY				
Environmental Engineering Techs	180	18	12	30
Environ. Science & Prod. Techs	204	20	40	60
Hazardous Waste Removal Wrkrs.	301	30	40	70
Water & Waste Treatment Plant Operator	-11	0	63	63

**TABLE 14
MASSACHUSETTS EMPLOYMENT PROJECTIONS
2020-2020
LIFE SCIENCES AND SERVICES OCCUPATIONS**

Description	Percent Employment Change 2010-2020	Percent Openings Due To Growth	Percent Openings Due Replacement
BIO-TECHNOLOGY			
Biological Scientists	17.4	43.2	56.8
Biological Technicians	20.8	38.1	61.9
Chemical Technicians	19.6	58.0	42.0
BIO-MANUFACTURING			
Medical Appliance Technicians	49.7	62.0	38.0
Medical Equipment Preparers	18.9	55.3	46.7
Medical Equipment Repairers	37.2	57.9	42.1
HORTICULTURE AND LANDSCAPING			
Landscapers and Groundskeepers	23.5	57.7	42.3
Pest Control workers	29.5	39.4	60.6
Nursery/Greenhouse Workers	No change	0	100.0
Florists	-15.8	0	100.0
ENVIRONMENTAL TECHNOLOGY			
Environmental Engineering Technicians	27.9	60.0	40.0
Environmental Science and Protection Technicians	21.5	33.3	66.7
Hazardous Waste Removal Workers	19.9	42.8	57.2
Waster and Water Treatment Plant Operators	-0.5	0	100.0
TOTAL, ALL OCCUPATIONS	13.7	37.9	62.1



Health Assisting (Table 15), Cosmetology (Table 17), and Early Childhood Education (Table 18) are the three programs with the most absolute openings in related occupations. Among specific occupations with large numbers of openings (exceeding 1000 annually) were Child Care Workers, Nurse's Aides, Personal/Home Care Aides and Home Health Aides. As Table 15 indicates, the growth rates for these 4 occupations, as well as many others in these three programs exceed the statewide growth rate by a wide margin. In addition, Hairdresser is also an occupation with a large number of openings, approaching 800 annually.

With regard to Culinary Arts (Table 16), with the exception of Institutional Cooks, all the other occupations are projected to have growth rates well below the statewide average, with Chefs: Fast Food Cooks actually declining. Replacement will account for most of the openings and be especially prevalent among Restaurant Cooks and Food Preparation workers.

A major advantage of the occupations in Health Assisting, Cosmetology and Early Childhood Education, as well as Culinary Arts, irrespective of employment projections, is that jobs in these fields are spread throughout the Commonwealth and are not geographically concentrated like many in the technical and science fields. This condition provides job seekers with a great deal of flexibility in finding the right type of position and location that best meets their needs.

The overall outlook for Hospitality and Tourism (Table 16) is, for the most part, quite modest in terms of both employment change and the projected number of openings. Growth rates for Flight Attendants, Hotel Lodging Managers, and Hotel resort Clerks are well below average, although the number of annual openings for Hotel Clerks (236) reflects their replacement needs. Tour Guides and Travel Agents are anticipating growth rates comparable to the statewide rate, but as they are small occupations each has fewer than 70 annual openings (Table 19). The major exception among the Hospitality and Tourism program is Meeting and Convention Planners. Employment in this occupation is expected to grow by over 50%, representing an increase of 1,076 jobs during the projections period. In addition, nearly 75% of the 146 annual openings are due to growth, which is a sign of a rapidly growing and dynamic occupation.



**TABLE 15
MASSACHUSETTS EMPLOYMENT PROJECTIONS
2006-2016
LIFE SCIENCES AND SERVICES OCCUPATIONS**

Description	Employment Change 2010-2020	Annual New Openings	Annual Replacement	Annual Total Openings
HEALTH ASSISTING OCCUPATIONS				
Medical Assisting	2,421	242	203	445
Home Health Aides	9,360	936	225	1,161
Nurse's Aide	8,057	810	539	1,349
Personal and Home Care Aides	9,921	992	173	1,165

**TABLE 16
MASSACHUSETTS EMPLOYMENT PROJECTIONS
2010-2020
LIFE SCIENCES AND SERVICES OCCUPATIONS**

Description	Employment Change 2010-2020	Annual New Openings	Annual Replacement	Annual Total Openings
CULINARY ARTS & HOSPITALITY				
Chefs and Head Cooks	-136	0	61	61
Cooks, Fast Food	-422	0	138	138
Cooks, Institutions & Cafeterias	1,529	153	183	336
Cooks, Restaurants	2,115	212	514	726
Cooks, Short Order	96	10	79	89
Bakers	339	34	131	165
Food Preparation Workers	1,407	141	687	828
Meeting Planners	1,076	108	38	146
Tour Guides	179	18	35	53
Travel Agents	349	35	39	65
Flight Attendants	28	3	36	39
Hotel and Lodging Managers	28	3	26	29
Hotel & Resort Clerks	183	18	118	236



TABLE 17 MASSACHUSETTS EMPLOYMENT PROJECTIONS 2010-2020 LIFE SCIENCES AND SERVICES OCCUPATIONS				
Description	Employment Change 2010-2020	Annual New Openings	Annual Replacement	Annual Total Openings
COSMETOLOGY/BARBERING				
Manicurists & Pedicurists	602	60	47	107
Hairdressers & Cosmetologists	4,374	437	361	798
Skin Care Specialists	572	57	38	95

TABLE 18 MASSACHUSETTS EMPLOYMENT PROJECTIONS 2010-2020 LIFE SCIENCES AND SERVICES OCCUPATIONS				
Description	Employment Change 2010-2020	Annual New Openings	Annual Replacement	Annual Total Openings
EARLY CHILDHOOD EDUCATION				
Pre-School Teachers	2,394	239	356	595
Kindergarten Teachers	695	70	97	167
Child Care Workers	5,037	504	985	1,489
Teacher Aide	4,599	460	768	1,128



**TABLE 19
MASSACHUSETTS EMPLOYMENT PROJECTIONS
2010 -2020
LIFE SCIENCES AND SERVICES OCCUPATIONS**

Description	Percent Employment Change 2010-2020	Percent Openings Due To Growth	Percent Openings Due Replacement
HEALTH AND DENTAL ASSISTING			
Medical Assisting	18.3	54.4	45.6
Home Health Aides	53.7	80.6	19.4
Nurse's Aide	19.4	60.0	40.0
Personal and Home Care Aide	45.4	85.2	14.8
Dental Assistant	13.4	35.0	65.0
Dental Hygienist	18.7	48.2	51.8
CULINARY			
Chefs and head Cooks	-4.0	0	100.0
Cooks, Fast Food	-6.5	0	100.0
Cooks, Institutions and Cafeterias	17.8	45.5	54.5
Cooks Restaurants	8.8	29.2	70.8
Cooks, Short Order	2.6	11.2	88.8
Bakers	7.5	20.6	79.4
Food Preparation Workers	7.4	17.0	83.0
HOSPITALITY and TOURISM			
Meeting Planners	53.5	74.0	26.0
Tour Guides	19.5	34.0	66.0
Travel Agents	12.6	53.8	46.2
Flight Attendants	1.5	7.7	92.3
Hotel and Lodging Managers	3.0	10.3	89.7
Hotel and Resort Clerks	6.2	7.6	92.4
COSMETOLOGY			
Manicurists and Pedicurists	23.3	56.0	44.0
Hairdressers and Cosmetologists	23.1	54.8	45.2
Skin Care Specialist	27.2	60.0	40.0
EARLY CHILDHOOD EDUCATION			
Pre School Teachers	17.5	40.2	59.8
Kindergarten Teachers	18,6	41.9	58.1
Child Care Workers	16.1	33.8	66.2
Teacher Aide	13.5	40.8	59.2



B. Life Sciences and Services Academy

2. Employment and Wage Summary May 2012

Tables in this section provide employment and wage information for the occupations related to the Bio-Technology, Horticulture and Landscaping, and Environmental Science programs.

All of the occupations within Bio-Technology are well paying (Table 20). As would be expected because of the educational requirements, Biological Scientists has both the highest entry level (\$61,640) and median wage (\$96,090). The largest occupation among the group, Biological Technicians, has an entry level wage of \$30,980 as compared to \$35,460 for Chemical Technicians. Their respective median wages are \$43,260 and \$48,080.

Within Bio-Manufacturing, wages for these occupations fall in a narrow range of between \$29,690 and \$32,200 for entry level positions. The gap does widen for median wages with Medical Equipment Repairers leading the way (\$44,300), followed by Medical Appliance Technicians (\$40,640) and Medical Equipment Preparers (\$37,900).

As noted earlier, Landscapers and Groundskeepers is one of the largest occupations related to any of the program academies with an estimated employment level of 31,127 in 2020. The wages (Table 21) are modest, with an entry level wage of \$23,520 as compared to a median wage of \$31,440. Pest Control Workers are the highest paying of this group with an entry level wage of \$31,830 and a median wage of nearly \$39,790. On the lower end of the scale are Nursery and Greenhouse Workers and Florists, with entry level wages of \$17,910 and \$20,200 respectively. These wages reflect in part the seasonal nature of work, especially for Landscapers and Nursery Workers. Landscapers often find winter work removing snow from both residential and commercial properties.

Among the Environmental Technology occupations (Table 22), despite its employment outlook, Water and Waste Treatment operators have both the highest entry level (\$38,570) and median (\$50,410) wage. Environmental Engineering Technicians were the second highest, with an entry level wage of \$35,100, followed by Hazardous Waste Removal workers (\$29,190) and Environmental Science and Protection Technicians (\$28,080).



TABLE 20 MASSACHUSETTS EMPLOYMENT PROJECTIONS 2010-2020 LIFE SCIENCES AND SERVICES OCCUPATIONS			
Description	Projected Employment Level	Entry Annual Hourly Wage May2012	Median Annual Wage May 2012
BIO-TECHNOLOGY			
Biological Scientists	1,389	\$61,640	\$96,090
Biological Technicians	6,165	\$30,980	\$43,260
Chemical Technicians	2,063	\$35,460	\$48,080
BIO-MANUFACTURING			
Medical Appliance Technicians	1,077	\$29,690	\$40,640
Medical Equipment Preparers	1,315	\$30,970	\$37,900
Medical Equipment Repairers	1,121	\$32,200	\$44,300

TABLE 21 MASSACHUSETTS EMPLOYMENT PROJECTIONS 2010-2020 LIFE SCIENCES AND SERVICES OCCUPATIONS			
Description	Projected Employment Level	Entry Annual Hourly Wage May2012	Median Annual Wage May 2012
HORTICULTURE AND LANDSCAPING			
Landscapers and Groundskeepers	31,127	\$23,520	\$31,440
Pest Control Workers	1,159	\$31,830	\$39,790
Nursery/Greenhouse Workers	2,427	\$17,910	\$25,010
Florists	1,226	\$20,200	\$26,460



TABLE 22 MASSACHUSETTS EMPLOYMENT PROJECTIONS 2010-2020 LIFE SCIENCES AND SERVICES OCCUPATIONS			
Description	Projected Employment Level	Entry Annual Hourly Wage May2012	Median Annual Wage May 2012
ENVIRONMENTAL TECHNOLOGY			
Environmental Engineering Technicians	826	\$35,100	\$45,670
Environmental Science & Protection Techs	1,153	\$28,080	\$35,970
Hazardous Waste Removal Workers	1,811	\$29,190	\$37,920
Water & Waste Treatment Plant Operators	2,440	\$38,570	\$50,410

Although the employment outlook for many occupations in this academy is positive, the wages are often modest at best. (See Tables 23-26). This is especially true among the Culinary and Cosmetology occupations, with one notable exception. The range of entry level wages for Cooks (Table 23), (except Chefs and Head Cooks) is quite narrow (\$17,730-\$22,650), as is the case for median wages (\$19,350-\$30,500). As noted above, Chefs and Head Cooks are the exception, with an entry level wage of \$37,820 and a median wage of \$52,010. In most instances however, Chefs and Head Cooks typically have some post-secondary education.

Modest wages are also paid to Cosmetology workers (Table 24). The very large Hairdresser and Cosmetology occupation reported an entry annual salary of \$18,940 and a median wage of \$27,690. Skin Care Specialists fared slightly better with an entry level wage of \$25,020 while Manicurists and Pedicurists did not do as well (\$17,780).

A factor contributing to the lower wages among Culinary and Cosmetology occupations is that positions are sometimes part-time, turnover can be high, and self-employment is pervasive in the latter category. This is especially true for Short Order and Fast Food Cooks and Cosmetology workers. For the very large Cosmetology occupation, more than 40% are self-employed which means being responsible for one’s own benefits. As tips are an integral part of compensation for Cosmetology workers, the type of shop they work in also is critical.



TABLE 23 MASSACHUSETTS EMPLOYMENT LEVELS AND WAGES LIFE SCIENCES AND SERVICES OCCUPATIONS			
Occupation	Projected Employment Level--2020	Entry Level Annual Wage May2012	Median Annual Wage May 2012
CULINARY / HOSPITALITY			
Chefs and Head Cooks	3,396	\$37,820	\$52,010
Cooks, Fast Food	6,062	\$17,730	\$19,350
Cooks, Institutions & Cafeterias	10,134	\$22,650	\$30,500
Cooks, Restaurants	26,254	\$21,660	\$27,430
Cooks, Short Order	3,787	\$19,120	\$25,830
Bakers	4,862	\$19,890	\$27,370
Food Preparation Workers	20,489	\$17,920	\$22,200
Meeting Planners	3,086	\$37,680	\$55,540
Tour Guides	1,095	\$19,700	\$29,650
Travel Agents	3,115	\$28,670	\$41,270
Flight Attendants	1,928	\$25,420	\$33,150
Hotel and Lodging Managers	974	\$35,850	\$61,090
Hotel & Resort Clerks	3,137	\$19,430	\$25,290

TABLE 24 MASSACHUSETTS EMPLOYMENT LEVELS AND WAGES LIFE SCIENCES AND SERVICES OCCUPATIONS			
Occupation	Projected Employment Level--2020	Entry Level Annual Wage May 2012	Median Annual Wage May 2012
COSMETOLOGY/BARBERING			
Manicurists & Pedicurists	3,185	\$17,780	\$19,560
Hairdressers & Cosmetologists	23,315	\$18,940	\$27,690
Skin Care Specialists	2,679	\$25,020	\$34,530



One prominent aspect for the Early Childhood occupations (Table 25) is the wage disparity. Kindergarten teachers reported a median annual wage of \$60,770, as compared to \$31,190 for Pre-School Teachers, \$24,600 for Child Care Workers, and \$25,830 for Teacher Aides. Educational attainment is a major contributor to the disparity, as almost all Kindergarten Teachers have at least a Bachelor’s Degree, compared to just under half for Pre-School Teachers. In addition, Kindergarten Teachers are primarily employed in public school systems, which typically pay better than the private child day care service providers, the more typical employer of Pre-School Teachers.

As noted above, Child Care Workers are at the bottom of the labor market queue, with regard to wages. Private Day Care providers are in a constant struggle to balance affordable day care costs with wages that are sufficient to attract and retain workers. Furthermore, the fact that one third of Child Care Workers are self-employed and responsible for their own benefits contributes to the high turnover associated with this occupation. Certainly lower educational attainment is a contributing factor to lower wages; just 14% have at least a Bachelor’s Degree, while half have a high school diploma. At the same time, a number of different job titles, including Day Care Teacher, Family Child Care Assistant, Day Care Provider, Child Care Group Leader and Child Care Kindergarten Coordinator, all require licenses in Massachusetts.

**TABLE 25
MASSACHUSETTS EMPLOYMENT LEVELS AND WAGES
LIFE SCIENCES AND SERVICES OCCUPATIONS**

Occupation	Projected Employment Level--2020	Entry level Annual Wage May 2012	Median Annual Wage May 2012
EARLY CHILDHOOD EDUCATION			
Pre-School Teachers	16,073	\$23,640	\$31,190
Kindergarten Teachers	4,459	\$33,480	\$60,770
Child Care Worker	36,322	\$19,280	\$24,600
Teacher Aide	38,639	\$19,180	\$25,830



Within the Health Assisting occupations (Table 26), distinct groups exist with regard to wages. The three aide occupations (Nurse Aide, Home Health Aide and Personal Home Care Aide) have relatively low entry level wages (\$20,860-\$24,060) and do not register marked increases over time as reflected in their median wage range (\$25,780-\$28,760). The wages tend to be suppressed due to high turnover associated with the wages and often difficult working conditions.

The second group includes Medical Assistants. The entry level wages are higher (\$29,000 and \$31,020) as are the median wages of \$35,600 and \$40,950. A wide range of wages exist among the six occupations related to Hospitality and Tourism. At the top of the pyramid is Meeting and Convention Planners and Hotel and Lodging Managers. Their respective entry level wages were \$37,680 and \$35,850 while the median wages for these two occupations were \$55,540 and \$61,090, respectively. In the middle were Flight Attendants (entry level wage \$25,420) and Travel Agents (\$28,670). The median wages were \$33,150 for Flight Attendants and \$41,270 for Travel Agents. At the low end of this group are Hotel and Resort Clerks and Tour guides with entry level wages just under \$20,000.

TABLE 26
MASSACHUSETTS EMPLOYMENT LEVELS AND WAGES
LIFE SCIENCES AND SERVICES OCCUPATIONS

Occupation	Projected Employment Level--2020	Entry Level Annual Wage May 2012	Median Annual Wage May 2012
HEALTH ASSISTING OCCUPATIONS			
Medical Assisting	15,664	\$29,000	\$35,600
Nurse's Aide	49,883	\$24,060	\$28,760
Home Health Aide	26,800	\$21,680	\$26,480
Personal and Home Care Aide	31,776	\$20,860	\$25,780



APPENDIX

A. Notes

1. Approval passed by 16n District Wide Ballot on September 20, 2016, with voters in 12 of the 16 member towns voting in favor of the new school by wide margins.
2. LMI Works
Robert Vinson, founder
www.lmiworksbv.com
3. General Advisory Committee
www.minuteman.org/about/general-advisory
4. Commonwealth Corporation
www.commcorp.org
See regional labor market development studies prepared with the Center for Labor Market Studies at Northeastern University
www.comcorp.org/resources/detail.cfm?ID=689

Center for Labor Market Studies at Northeastern University
www.northeastern.edu/clms

Massachusetts Department of Labor and Workforce Development
www.mass.gov/lwd/
5. Data sources produced by the Massachusetts Department of Labor and Workforce Development
Labor Market Information
Projections: Massachusetts Employment Projections Between 2010 and 2020
Occupations: Massachusetts Occupational Wage Survey for Employment and Wages,
May, 2012
6. National statistics come from the US Bureau of Labor Statistics
www.bls.gov
7. The National Center for O*NET
www.onetcenter.org
8. DESE MGL Chapter 74 regulations
www.doe.mass.edu/cte/programs
9. Minuteman website
www.minuteman.org/how-we-learn/academys-majors www.minutemanti.org/post-graduate-programs



B. Additional Reading

1. Symonds, W. C., Schwartz, R. B., Keppel, F., Ferguson, R. *Pathways to Prosperity*. Cambridge: Harvard Graduate School of Education, February, 2011
www.gse.harvard.edu/news_events/features/2011_Pathways_to_Prosperty_Feb2011
2. Research and Policy Analysis studies: www.commcorp.org/publications
3. Carlson, P., Holm, R., and Uhalde, R. *Building Regional Partnerships for Economic Growth and Opportunity*. Boston: Jobs for the Future, February, 2011.
www.iff.org/publications/workforce/building-regional-partnerships-economic-/1041
4. See also the work of Paul E. Harrington, former associate director Northeastern University Center for Labor Market Studies, now at Philadelphia-based Drexel University.
5. Dwyer, M. C. *Re-Investing in Arts Education: Winning America's Future*. President's Committee on the Arts and the Humanities. Washington, DC: May, 2011. Prepared by M. Christine Dwyer, RMC Research Corporation, Portsmouth, NH. www.pcah.gov.
6. Bal, N. *A Report on the Massachusetts Film Industry Tax Incentives*. Boston: Commonwealth of Massachusetts, Department of Revenue. January, 2011
www.stop-runaway-production.com/wp-content/uploads/2009/07/2009-Mass.-Dept.-of-Revenue
7. Jacobs, J. Top 10 Cities to be a Moviemaker: 2012. *MovieMaker Magazine*. January 16, 2012.
www.moviemaker.com



C. Tables

Table A: Industries Related to One or More Minuteman Regional Technical Vocational High School Ch. 74 Programs

TABLE A INDUSTRIES RELATED TO ONE OR MORE MINUTEMAN REGIONAL TECHNICAL VOCATIONAL HIGH SCHOOL CHAPTER 74 PROGRAMS	
	Description
Construction	
	Construction of Buildings
	Specialty Trade Contractors
Manufacturing	
	Manufacturing
	Bakeries
	Printing and Related Support Activities
	Pharmaceuticals
	Fabricated Metal Product Manufacturing
	Machinery Manufacturing
	Computer and Electronic Product Mfg
	Communication Equipment
	Semi-Conductors
	Navigational and Controlling Instruments
	Electrical Equipment
	Medical Equipment and Supplies
Wholesale and Retail Trade, Transportation	
	Wholesale Trade
	Wholesale, Plumbing Supplies
	Retail Trade
	Motor Vehicle and Parts Dealers
	Automobile Dealers
	Auto Parts, Accessories, and Tire Stores
	Electronics Appliance Stores
	Lawn and Garden Equipment
	Grocery Stores
	Gasoline Stations
	Department Stores
	Air Transportation
Information	
	Publishing
	Newspaper, Book, & Directory Publishers
	Motion Picture & Sound Recording Industries
	Telecommunications (Cable and Telephone)
Finance and Insurance	
	Finance and Insurance
	Credit Intermediation & Banking



TABLE A	
INDUSTRIES RELATED TO ONE OR MORE MINUTEMAN REGIONAL TECHNICAL VOCATIONAL HIGH SCHOOL CHAPTER 74 PROGRAMS	
	Description
	Insurance Carriers & Related Activities
	Legal Services
	Engineering and Architecture Services
	Computer Systems Design and Related Services
	Management & Technical Consulting Services
	Scientific Research and Development Services
	Advertising and Related Services
	Business Support Services
	Travel Arrangement Services
	Services to Buildings and Dwellings
	Waste Water Treatment and Waste Removal
Education , Health and Social Services	
	Education
	Elementary and Secondary Education
	Colleges and Universities
	Health Care and Social Assistance
	Offices of Physicians
	Offices of Dentists
	Outpatient Care Centers
	Home Health Care Services
	Hospitals
	Nursing and Residential Care Facilities
	Child Care Services
Leisure and Hospitality	
	Museums
	Amusement & Recreation
	Accommodation
	Hotel Accommodation
	Food Services and Drinking Places
Other Services and Government	
	Automotive Repair and Maintenance
	Electrical Repair
	Business Services Organizations
	Personal Care Services
	Nurseries
	State and Local Government Administration

B. TABLE B: Minuteman Regional Vocational School Ch. 74 Programs: Related Occupations and Key Industries

TABLE B MINUTEMAN REGIONAL VOCATIONAL TECHNICAL SCHOOL CHAPTER 74 PROGRAMS: RELATED OCCUPATIONS AND KEY INDUSTRIES				
CIP Code	Minuteman Vocational Programs	Related Occupations	Related SOC Codes	Key Industries (NAICS Code in Parenthesis)
Engineering, Construction, and Trades Academy				
47.0604	Automotive Technology	Automotive Service Technician	49.3023	Auto Dealers (4411) Auto Parts Stores (4413) Gas Stations (447) Auto Repair Shops (8111)
46.0201	Carpentry	Carpenters Carpenter Helpers	47.2031 47.3012	Bldg Contractors (236) Specialty Trade Contractors (238)
46.0302	Electricians/Electrical Wiring	Electricians Electrician Helpers Telecommunications Equipment Installers Security and Alarm Installers	47.2111 47.3013 49.2022 49.2098	Specialty Trade Contractors (238) Electrical Equipment (335) Education (61) Services to Buildings (5617) Telecommunications (517)
47.0201	HVAC	Heating, Air Conditioning, Refrigeration Mechanics and Installers Valve and Control Installers and Repairers	49.9021 49.9012	Specialty Trade Contractors (238) Wholesale Plumbing Supplies (4237) Services to Buildings ((5617) Education (61)
46.0503	Plumbing	Plumbers Pipefitters Helpers, Plumbers and Pipefitter	47.2512 47.2152 47.3019	Plumbing, Heating AC Contractors (283) Non Residential Building (236) Services To Buildings (5617) Wholesalers, Hardware and Plumbing (4237)
48.0599	Metal Fabrication And Welding	Welders, Solderers and Cutters Sheet Metal Worker Structural Metal Workers	51.41 21 47.2211 51.2041	Specialty Trade Contractors (238) Fabricated Metals (332) Machinery (333) Commercial Machinery Repair (8113)

**TABLE B
MINUTEMAN REGIONAL VOCATIONAL TECHNICAL SCHOOL CHAPTER 74 PROGRAMS: RELATED OCCUPATIONS AND KEY INDUSTRIES**

CIP Code	Minuteman Vocational Programs	Related Occupations	Related SOC Codes	Key Industries (NAICS Code in Parenthesis)
11.0401 11.0201	Program and Web Design Information Science	Computer Programmer Computer Support Specialists Information Security Specialist and Web Designers	15.1131 15.1150 15.1799	Computer Systems Design (5415) Insurance Carriers (524) Computer and Electronics Manufacturing (334) Education (61) Banking (522)
10.0301 10.0304 50.0401	Design and Visual Communication	Graphic Designer Commercial and Industrial Designer Set and Exhibit Designer Multi Media Artists	27.1024 27.1021 27.1027 27.1014	Newspapers, Periodicals and Books (5111) Advertising (5418) Specialized Design Services (5414) Motion Pictures and Video Industries (512) Scientific and Technical Consulting (5417) Printing (323)
09.0701 10.0201 10.0203	Radio and Television Broadcasting Multi-Media Engineering/Technology	Audio and Video Technicians Film and Video Editor Camera and Video Operators Multi Media Artists Sound Engineering Technicians Set Designers	27.4011 27.4032 27.4031 27.1014 27.4014 27.1027	Motion Picture and Video Industry (5121) Performing Arts (711) TV Broadcasting (5151) Advertising (5418) Radio Broadcasting (5151) Sound Recording Services (5122)
48.0599 15.0000 15.0403	Robotics Engineering Automation	Electrical and Electronic Technicians Electro-Mechanical Technicians Home Entertainment Installers Telecommunications Installers Computer and Office Machine Repairers Electro-Mechanical Technicians Robotics Technicians Mechanical Engineering Technicians Manufacturing Production Technicians	17.3023 17.3024 49.2097 49.2032 49.2011 17.3020401 17.3027 17.3029	Machinery Mfg (333) Computer and Electronics Mfg (334) Electronics and Appliance Stores (443) Cable and Telephone Providers (517) Electronics Repair (8112) Navigational, Measuring and Control Instruments (3345) Engineering and Architectural Services (5413) Research and Development , Engineering and Physical Sciences (5417) Communication Equipment (3342) Semi-Conductor and Electronic Components (3344)

Life Science and Services Academy

**TABLE B
MINUTEMAN REGIONAL VOCATIONAL TECHNICAL SCHOOL CHAPTER 74 PROGRAMS: RELATED OCCUPATIONS AND KEY INDUSTRIES**

CIP Code	Minuteman Vocational Programs	Related Occupations	Related SOC Codes	Key Industries (NAICS Code in Parenthesis)
51.0000	Health Assisting	Medical Assistant Nursing Aides and Orderlies Home Health and Elder Care Aides Personal and Home Care Aides	31.9092 31.1012 31.1011 39:9021	Hospitals (622) Nursing and Residential Care Facilities (623) Physicians' Offices (6111) Outpatient Facilities (6114) Home Health Services (6116)
12.0401	Cosmetology	Cosmetologists and Hairdressers Manicurists and Pedicurists Skin Care Specialists	39.5012 39.5092 39.5094	Personal Care Services (8121) Department Stores (4521)
12.0500 52.0901	Culinary Arts Hospitality and Tourism	Chef and Head Cooks (includes Pastry Chefs) Cooks, Fast Food Cooks, Institutions and Cafeterias Cooks, Restaurants Cooks, Short Order Bakers Food Preparation Workers Hotel and Lodging Managers Hotel and Resort Clerks Meeting and Convention Planners Travel Agents Tour Guides Flight Attendant	35.1011 35.2011 35.2012 35,2014 35,2015 51.3011 35.2021 11.9081 43.4081 13.1121 41.3041 39.7012 53.2031	Food Services (722) Grocery Stores (4451) Education (61) Nursing and Residential Care (623) Hospitals (622) Hotels (7211) Amusement and Recreation Parks (713) Bakery Manufacturing (3118) Accommodation (721) Museums (7121) Travel Arrangement Services (5615) Business Service Organizations (813) Air Transportation (481)
13.1210	Early Education and Care	Child Care Worker Teacher Aide Pre School Teacher Kindergarten Teacher	39.9011 25.9041 25.2011 25.2012	Child Care Services (6244) Individual and Family Services (6241) Elementary and Secondary Education (6111)
26.0101 15.0401	Bio Science	Biological Technicians Biological Scientists Chemical Technicians Medical Appliance Technician Medical Equipment Preparers Medical Equipment Repairers	19.4021 19.1029 19.4031 51.9082 31.9093 49.9062	Colleges and Universities (6113) Research and Development (5417) Pharmaceutical Mfg (3254) Hospitals (622) Medical Equipment Supplies (3391)

**TABLE B
MINUTEMAN REGIONAL VOCATIONAL TECHNICAL SCHOOL CHAPTER 74 PROGRAMS: RELATED OCCUPATIONS AND KEY INDUSTRIES**

CIP Code	Minuteman Vocational Programs	Related Occupations	Related SOC Codes	Key Industries (NAICS Code in Parenthesis)
01.0601 01.0605	Horticulture and Landscaping Technology	Nursery Workers Landscapers and Groundskeepers Pest Control Workers Florists	45.2092 37.3011 37.2011 27.1023	Services to Buildings (5617) Lawn and Garden Equipment (4442) Nurseries (1114)
15.0507	Environmental Science Technology	Environmental Engineering Technician Environmental Science and Protection Technicians Hazardous Waste Removal Operators Water and Waste Water Treatment Operators	17.3025 19.4091 47.4041 51.8031	Management, Scientific and Technical Consulting (5416) Engineering and Architecture Services (5413) Colleges and Universities (6113) Waste Treatment and Disposal (5622) Remediation and Waste Management (5629) Hospitals (622)



Table C: Current Clusters and Programs and Proposed Academies and Programs

CURRENT CLUSTERS AND PROGRAMS (June 2014)				
EXISTIN	Trades and Transportation	BioScience/Engineering	Human, Business & Commercial Services	
	EXISTING MAJORS (June 2014)			
	Automotive Technology 47.0604	Biotechnology 15.0401	Barbering 12.0402	
	Carpentry 46.0201	Environmental Science & Technology 15.0507	Cosmetology 12.0401	
	Electrical Wiring 46.0302	Health Assisting 51.0000	Culinary Arts/Baking 12.0500	
	HVAC/Refrigeration 47.0201	Horticulture & Landscaping Tech 01.0601	Early Education & Care 13.1210	
	Metal Fabrication 48.0599	Engineering Technology 15.0000	Hospitality Management 52.0901	
	Plumbing 46.0503	Robotics & Automation Technology 15.0403	Design & Visual Communication 50.0401	
		Telecommunications/Fiber Optics 15.0305	Marketing 19.0203	
			Programming & Web Development 11.0201	
	PROPOSED ACADEMIES AND PROGRAMS (Sep 2016)			
	Engineering, Construction, and Trades Academy		Life Sciences and Services Academy	
	628 STUDENT ENROLLMENT			
	Advanced Manufacturing 48.0501 / 48.0599		Culinary/Hospitality 12.0500/52.0901	
	Electrical 46.0302		Early Education & Care 13.1210	
Plumbing 46.0503 / 47.0201		Cosmetology & Barbering 12.0404 / 12.0402		
Carpentry 46.0201		Health Occupations 51.0000		
Automotive 47.0604		Environmental Science & Technology 15.0507		
Multi-Media Engineering (New) 09.0701		Biotechnology 15.0401		
Robotics Engineering Automation 15.0000 / 15.0403		Horticulture 1.0601		
Programming & Web Development 11.0201				
Design & Visual Communications 50.0401				
ELIMINATED MAJORS (June 2018)				
	Marketing 19.0203			
	Telecommunications/Fiber Optics 15.0305			
PROPOSED				