

CAREER & TECHNICAL EDUCATION PROGRAMS

The Career & Technical Education (CTE) programs offer our Newton Public School students unique opportunities to explore a variety of career fields. During the students' CTE program experience, they will access, analyze, and synthesize information, create and problem solve using critical and innovative thinking skills as well as collaborate in teams, develop leadership skills and enhance their communication skills. Through a comprehensive sequencing of technical and academic courses, students develop a solid foundation of knowledge and 21st century competency skills essential for a smooth transition to college/university and or the workforce. Students who participate in CTE programs develop an individual Career Plan designed to help them make informed choices, traditional and non-traditional, now and for their futures. Upon graduation, students will be prepared to pursue a two- or four-year college education, a technical training institute, apprenticeships, and/or enter the workforce. Students who complete a three-year CTE Major program receive a high school diploma, as well as a certificate of completion in the CTE program of study, an OSHA 10 Certification, and an industry recognized certification (Automotive Technology, Construction Technology, Culinary Arts, and Early Education & Care). Six of the Newton Public Schools CTE programs are Chapter 74 approved, meaning they meet rigorous state requirements including a set number of hours of study in a field.

All CTE programs are regularly reviewed by the Department of Elementary and Secondary Education.

Chapter 74

Career & Technical Education Programs:

Automotive Technology	Culinary Arts
Carpentry/Construction Technology	Drafting
Early Education & Care	Graphic Communications

Non-Chapter 74

Career & Technical Education Programs:

Design & Visual Communications
TV Media Arts

EXPLORATORY PROGRAM

The first course in the sequence of a CTE program is called Exploratory Program. During this course a student "explores" the career area while developing the necessary foundation of competency-based knowledge and skills as well as safety fundamentals in the technical field of interest. During the Exploratory Program, students research a variety of occupational and career information using an assortment of internet platforms, and begin to create and develop an individualized Career Plan.

9th and 10th grade students have first preference into Exploratory Programs; Exploratory meets four blocks a week for one semester.

MAJOR 1

Students who have successfully completed the Exploratory Program course and would like to continue their education and training in the chosen CTE program apply to pursue Major 1. During Major 1 students enhance and expand on the foundation of knowledge and skills established in exploratory. Students continue to develop their career plans, and learn the value of a strong work ethic while focusing on skills necessary for the 21st century. Career planning at this level requires students to explore labor market trends in the chosen CTE program and related fields, build a personal budget based on an occupation of interest and earn a Safety Training Certificate.

Major I courses meet four blocks per week for the full year.

To apply to a CTE program as a major 1, students need to have placed well according to the Exploratory Program Rubric, earned an Exploratory Safety Training Certificate, received the teacher's recommendation and complete the CTE program application. For applications see the CTE teacher, counselor, CTE office in room 112 or refer to the form in the back of this Opportunities Book.

MAJOR 2

Major 2 is the next course in the sequence of a CTE program of study and is for students who want to cultivate their knowledge and skills in the field of study, who have successfully completed Major 1 and who have been recommended by the teacher. During Major 2 students apply and strengthen their knowledge and skills by engaging in real-world experiences in their CTE learning environment.

Major 2 courses meet 8 blocks a week.

Students in Major 2 will be registered for Health & Wellness (PE033); this PEHW course includes First Aid, Safety and CPR and is incorporated into the 8 blocks. This PEHW meets a graduation requirement and is also a requirement to be eligible for a cooperative education work place learning experience second semester in their senior year.

MAJOR 3

For students who have developed a genuine interest in the CTE program, who have successfully completed Major 2 and who have been recommended by the teacher, Major 3 is the last course in the sequence of the CTE program of study. Students refine their foundation of academic knowledge and technical competency skills.

Major 3 courses meets 12 blocks a week.

Students in the Major 3 will be registered for Entrepreneurship (759) in the fall of their senior year (with exception to those in Culinary Arts and Graphic Communications; it's an embedded aspect of these two programs).

Entrepreneurship is a requirement to be eligible for a cooperative education work place learning experience second semester senior year.

Students who complete Major 3 in a CTE program are eligible to receive college credits through post-secondary articulation agreements when they continue their education in the career pathway. These credits are issued after the completion of the first semester of their post-secondary studies. At the end of the Major 3 description for each CTE program there is a list of the post-secondary institutions and the course number offered in the articulation agreement.

HONORS OPTION FOR MAJOR 2 AND MAJOR 3:

Major 2 and 3 students may be recommended for the honors level by their teacher if they have demonstrated the following:

- Interest, ability and motivation to meet the challenges of an honors level course.
- The ability to be an independent learner in the program setting.
- Aspirations for an advanced level of learning and critical thinking through more challenging assignments, coursework and learning opportunities.
- Assistance with program/shop management.
- The ability to simultaneously handle multiple projects.
- Desire to take on complex projects and be held to a higher standard of quality.
- Commitment to complete projects before or after school when necessary.
- Leadership and collaborative teamwork skills to coordinate a team of students to complete a group project.

CAREER & TECHNICAL EDUCATION COOPERATIVE WORK EXPERIENCE

CTE Co-Op work experience is available to students in Major 3. The cooperative education work placement offers students an additional learning dimension to their educational experience and is designed to apply and expand their knowledge and skills with an authentic work experience in the business community. This is a paid, supervised, instructional experience that is directly related to the student's CTE program. A student's day is divided between their academic studies and their work-site training. Students are eligible for a cooperative education workplace learning experience second semester of their senior year if they fulfill the course requirements, demonstrate an 80% or better proficiency in their competency skills, have a good attendance record, demonstrate a strong work ethic, are in good academic standing, successfully earn their OSHA 10 Certification for safety, completed their Career Plan, and received the recommendation of their teacher.

POST-GRADUATE


Consideration for post-graduate CTE study will be made on a space available basis, and only with the approval of the principal and Director of Career & Technical Education. Applicants should see their guidance counselor to begin this process mid-way through their senior year. The guidance counselor will contact the CTE director about the request who will then notify the principal and schedule an interview to meet with the student.

NOTE:

The Massachusetts Community Colleges approved a statewide Articulation Agreement in 2014 in 14 vocational technical fields to provide a seamless transition for students. The programs offered by the Newton Public Schools with articulation to the community college system include: Automotive Technology (Transportation), Carpentry, Culinary Arts, Drafting and Early Education & Care (Early Childhood Education). The information can be accessed on the following website: <http://www.masscc.org/articulation>

Automotive Technology – CIP CODE: 470604

880	Exploratory Automotive Technology	no level	9-10	F or S	4 periods	2.5 credits
88011	Exploratory Automotive Technology	no level	11-12	F or S	4 periods	2.5 credits

 The student will develop a fundamental knowledge and understanding of the basic automobile systems including the use of tools and equipment, and safe workplace practices. The automobile systems introduced include those involved with the maintenance and repair of light duty vehicles. Proper dress and footwear is required.

882	Automotive Technology Major I	ACP	10-11	full year	4 periods	5 credits
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Prerequisite: Successful completion of Automotive Technology Exploratory 880

The Major 1 offers students an opportunity to further develop their skills and to explore the idea of entering the automotive field and to prepare for college. Students will build on, and expand the foundation of competency skills they developed in the Exploratory Program. Proper dress and footwear is required in the Major (1,2, & 3).

Culinary Arts – CIP CODE: 120503

902	Exploratory Culinary Arts	no level	9-10	F or S	4 periods	2.5 credits
90211	Exploratory Culinary Arts	no level	11-12	F or S	4 periods	2.5 credits



For students who want to explore a career in food service, the Tiger's Loft Bistro, a student-run restaurant, is the place to start. Students will be introduced to quantity food preparation and gain practical experience serving the school community. Students will rotate through baking and culinary stations on a daily basis. Students will develop and apply basic food service, sanitation, and kitchen safety skills.

905	Culinary Arts Major I	ACP	10-11	full year	4 periods	5 credits
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Prerequisite: Successful completion of Culinary Arts Exploratory – 902

The students will continue to build and fine tune their culinary skills by continuing to work in the Tiger's Loft Bistro. Students in Major 1 will work alongside Major 2 & 3 students at different work stations. They will build on the foundation of competency skills established during their exploratory experience and develop customer service communication skills.

Proper dress and footwear are required in the Major (1, 2, & 3)

9064	Culinary Arts Major 2	H	11-12	full year	8 periods	10 credits
906	Culinary Arts Major 2	ACP	11-12	full year	8 periods	10 credits

Prerequisite: Successful completion of Culinary Arts Major I – 905

Students in the Culinary Arts Major 2 will do advanced work in a commercial kitchen and be taught the techniques for preparing foods and menus that are nutritionally balanced. Students will develop and demonstrate an understanding of theory and practice with culinary and baking & pastry arts along with food service management. Students in the Major 2 will co-mentor with students in Major 3 to coach and supervise students in the Major 1. Major 2 students will learn how to use the point of sales system (POS), to ring sales, track the number of sales and earnings, and generate product rotation inventory reports using the POS system, the "Back-Office system". Students will be enrolled in the ServSafe Certification program.

9074	Culinary Arts Major 3	H	12	full year	12 periods	15 credits
907	Culinary Arts Major 3	ACP	12	full year	12 periods	15 credits

Prerequisite: Successful completion of Culinary Arts Major 2 - 906 or 9064

Major 3 students will use the skills and competencies they developed during the Major 1 & 2 to take responsibility for supervising the daily operation of the Tiger's Loft Bistro. Students will increase their leadership skills doing advanced work in the commercial kitchen and act as mentors to Major 1 and 2 students. They will practice skills to manage the logistics of operating a restaurant, such as, event planning, researching new equipment, preparing estimate proposals for purchasing, planning food orders, and communicating with purveyors to place orders to restock the kitchen. Students will learn the skills necessary to successfully manage both the front and back of the house.

Post-Secondary Articulation Agreements Include:

Johnson & Wales University - as a participant in the FAST program.

Newbury College- CU101 Culinary Science and Theory, CU102 American Cuisine, and CU103 Bread & Rolls

Culinary Institute of America - ServSafe

Design & Visual Communications – CIP CODE: 500401

978	Exploratory Design & Visual Communications	no level	9-10	F or S	4 periods	2.5 credits
97811	Exploratory Design & Visual Communications	no level	11-12	F or S	4 periods	2.5 credits



Do you have a great idea for an advertisement, 3D design, logo, or commercial you wish could become a visual reality? This class is the first step in learning to bring ideas to life. This exploratory course welcomes students of all backgrounds to learn the creative design process. Students will research solutions to design prompts, illustrate concepts, articulate and critique design ideas, and manipulate digital images. Final drafts of movie posters, 3D drawings, digital sketches, and animations will be created on the computer with professional programs such as Adobe Photoshop, Adobe Illustrator, Adobe Flash and 123D. Design is not simply knowledge, but a way of thinking, and design skills are becoming increasingly sought after in the competitive job market in a variety of career fields. Students will gain a strong design foundation, allowing them to approach problems with a creative mind, think more critically, and innovate beyond typical classroom boundaries through authentic work experience.

979	Design & Visual Communications, Major 1	ACP	10-11	full year	4 periods	5 credits
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Prerequisite: Successful completion of Design & Visual Communications Exploratory 978.

In Major 1, students will engage in a variety of projects, applying the design principles, psychology of color, and computer skills learned in the Exploratory Program. They will investigate and analyze branding, advertisements, and websites, while discussing effective marketing strategies and techniques. Through the creative use of color, images, type, and marketing themes, students will create their own commercials, 3D typography, posters, animations and advertisements. Students will start to operate as their own design firm, employing the creative design process (brainstorming, researching, sketching, articulating concepts, critiquing design ideas, and creating computer design layouts) to create the NNHS Course Catalog cover and posters for the Music and CTE departments. Students will add to the repertoire of tools used including Flash, iMovie, Garage Band, InDesign, digital cameras, and video cameras. Students in the Major 1 will be encouraged to experiment with new ideas leading to innovation.

9814	Design & Visual Communications, Major 2	H	11-12	full year	4 periods	5 credits
981	Design & Visual Communications, Major 2	ACP	11-12	full year	4 periods	5 credits

Prerequisite: Successful completion of Design & Visual Communications Exploratory 978 and Major 1- 979

In Major 2, students will master the creative design process and advanced principles of design, and apply their skills to authentic projects while operating as their own design firm, fostering independence. The class is provided with opportunities to work alongside professional design, marketing, and production teams from companies such as Legal Sea Foods, Scientific Publishing, and Lemelson-MIT. Students will work individually and in groups to complete projects and foster skills such as communicating with clients through e-mail, meeting deadlines, and giving professional design presentations. They will learn the essential elements of photography and its application to design concepts while using professional-level digital cameras.

9834 Design & Visual Communications, Major 3	H	11-12	full year	8 periods	10 credits
983 Design & Visual Communications, Major 3	APC	11-12	full year	8 periods	10 credits

Prerequisite: Successful completion of Successfully completed Advanced Design & Visual Communications 981, 9814 with a grade of 80 or above and be recommended by the teacher.

In Major 3, students will build on the experience, skills, and projects covered in all prior Design & Visual Communications courses. This class operates as a professional design firm, and students take a personal stake in their own growth. They work more independently on long-term "live projects" and take on additional responsibilities as lead designers for group projects. Projects in previous years have included: a kids' website for Legal Sea Foods, an award-winning website for the CTE department, a nationally recognized invention showcased at the White House Science Fair, and collaboration on special projects with design firms such as Continuum and SandCartStudio. As designers, students will develop new skills in leadership, project and time management, scheduling, working with clients, and advanced design and computer techniques. Skills associated with design are increasingly sought after in today's competitive markets. Upon completion of the Design curriculum, students are fully equipped with authentic experience and a strong skill set for the pursuit of any career.

984 Design & Visual Communications Ind. Study no level 11-12 full year 2.5 credits

The self-motivated and disciplined student, on arrangement with the Design & Visual Communications instructor, will sign a contract including their proposal to undertake the study of any subject or project in the profession in which the student has a particular interest.

Requirement: the student must have completed five of seven Core Curriculum/Required Courses Design & Visual Communications Majors. The student must also be taking a Design & Visual Communications course. Approval from the Director of CTE is also required.

Drafting – CIP CODE: 151301

911 Exploratory Drafting no level 9-10 F or S 4 periods 2.5 credits

9111 Exploratory Drafting no level 11-12 F or S 4 periods 2.5 credits



Do you like designing spaces or inventing things? Have you ever considered a career in well-paid professions such as: Architecture, Interior Design, Engineering, Industrial Design, Landscape Design or Real Estate? If so, taking an exploratory class in Drafting could be a terrific place for you to get started in exploring the fundamental drafting skills required for these interests and their related professions. In Drafting Exploratory students learn to draft exciting 3dimensional spaces and objects on the computer through using two different industry standard softwares: Autodesk's Revit and Inventor programs. These drafting software programs allow you to see your creations in a realistic 3 dimensional shape, you can create walk through videos of your buildings; you can assemble parts and even make them move! The course introduces the basic drafting principles of reading drawings, and creating spaces and objects. Many assignment opportunities allow students to apply their drafting skills into projects of their own design, for example: you could design and draft a house, a golf course, or even a cell phone case! If you like exploring how spaces or parts are designed and would like to try drawing them on the computer, then this is the class for you!

915 Architectural Drafting Major 1 ACP 10-11-12 full year 4 periods 5 credits

Prerequisite: Successful completion of Drafting Exploratory - 911

This is the Drafting Major study for students who would like to continue their drafting with the focus of the built environment using the Revit software as begun in Exploratory. Drafting will focus in areas such as: Buildings, Interiors, Structural Design, & Landscape. In this course, the student has the opportunity to advance their emerging drafting and design skills creating projects that emphasize design standards, construction details, and presentation techniques. Students in the Major 1 will begin developing their portfolio for future college design portfolios and business/internship portfolios. Major 1 students will begin working with Lumion Software for more realistic renderings to their Revit drafted projects. In addition to the 3-D printing on the Maker-Bot, students will create traditional hand built models to explore a variety of things such as overall design concepts to foundation details. There is also an introduction to hand drawing perspective and rendering techniques as well as a beginning introduction to historic American Architectural house styles and details. The Architectural Drafting Major offers a wide variety of projects to allow students to continue exploring the many different college & career skills for professions that specialize in the built environment.

9164 Architectural Drafting Major 2 H 11-12 full year 8 periods 10 credits

916 Architectural Drafting Major 2 ACP 11-12 full year 8 periods 10 credits

Prerequisite: Successful completion of Major 1 - 915.

The Architectural Drafting Major 2 study is a continued development of a student's Architectural Drafting and Design techniques: including continued development of Revit and Lumion software knowledge, construction document drawings, recreation of a historical architectural building, continued exploring historical architectural styles and designing a variety of different projects and building types. Students also continue to work on their hand drafting/rendering & model building skills; there is also continued development of the student's portfolios for possible future college portfolio submissions and business/internship opportunities. There are potentials for students to work on community projects as well. The Major 2 offers students continued development and exploration of the many different college & career skills for professions that specialize in the built environment. Students in the Major 2 will be registered in Art Minor 1, embedded in the 8 periods of drafting, so they can begin developing their portfolio which is a requirement of many postsecondary institutions for drafting.

9174 Architectural Drafting Major 3 H 12 full year 12 periods 15 credits

917 Architectural Drafting Major 3 ACP 12 full year 12 periods 15 credits

Prerequisite: Successful completion of Major 2 - 916 or 9164

The Architectural Drafting Major 3 student will continue to strengthen their Architectural Drafting and Design skills as developed in previous years, the Major 3 will also include the mechanical and structural systems into the Revit BIM software, and creating a small set of Construction Documents for a single-family residence. There is continued development of the student's portfolio to demonstrate the culmination of design, drawing, model building and construction details that a student has been developing through independent and community drafting work over their Architectural Drafting Major Studies.

919 Engineering Drafting - Mechanical Major I **ACP** **10-11-12** **full year** **4 periods** **5 credits**

Prerequisite: Successful completion of Drafting Exploratory, 911

This is the Drafting Major study for students that would like to continue their drafting with the focus of the manufacturing engineering and technology fields using the Inventor & Revit @software as begun in Exploratory-drafting will focus in areas such as: technical drawing, graphical computation, and descriptive geometry. In this course, the student has the opportunity to advance their emerging drafting and design skills creating projects that emphasize 3-D modeling, assembling and presentation techniques. Students in the Major 1 will begin developing their portfolio for future business/internship portfolios and or college, if and when needed. The students will also have the opportunity to learn more about the many drafting career pathways in the Manufacturing, Engineering, and Technology fields.

9204 Engineering Drafting -Mechanical Major 2 **H** **11-12** **full year** **8 periods** **10 credits**

920 Engineering Drafting -Mechanical Major 2 **ACP** **11-12** **full year** **8 periods** **10 credits**

Prerequisite: Successful completion of Engineering Drafting Major 1, 919

The Mechanical Major 2 continues to focus on more intermediate level drafting challenges using Inventor® and Revit @software. Students will learn to produce 3 dimensional and solid modeling graphics to produce mechanical parts that they may also be able to print on the 3-d printer or layout mechanical systems in a 3-D modeled building. Mechanical Major 2 students look at additional drawing practices for advanced assemblies, weldment and sheet metal drawings. Some of the work will be used as part of the student portfolio package for possible future internships or college when needed. The Mechanical Major 2 student has opportunities to work on community projects as well. This course is aimed at the student wishing to become proficient in 3 dimensional and solid modeling, and is preparing to pursue engineering in college.

9214 Engineering Drafting -Mechanical Major 3 **H** **11-12** **full year** **12 periods** **15 credits**

921 Engineering Drafting -Mechanical Major 3 **ACP** **11-12** **full year** **12 periods** **15 credits**

Prerequisite: Successful completion of Engineering Drafting Major 2, 920 or 9204

The Mechanical Major 3 program continues to focus on more advanced intermediate level drafting challenges using Inventor® and Revit @software. This is the course for a student who wants to become proficient in 3 dimensional and solid modeling and is preparing for employment in the industry and/or to pursue engineering in college. The students will develop a portfolio selecting the pieces of work representing the scope of their skills.

Early Education and Care – CIP CODE: 131210

894 Exploratory Child Development **no level** **9-10** **F or S** **4 periods** **2.5 credits**

89411 Exploratory Child Development **no level** **11-12** **F or S** **4 periods** **2.5 credits**



Students will study the intellectual, emotional, social, and physical domains of early child development. Students will identify components of development domains as related to play, discipline, reasoning and psychological theories. Class time will include observing and assisting in the preschool laboratory setting. Students will participate in periodic staff meetings where discussions regarding their questions and observations of the children will take place. Actual infant simulators will be used in conjunction with the study and analysis of general infant development. Professional articles will be used to further discuss topics of study, in addition to the textbook, *The Developing Child*, by Holly Brisbane

895 Early Education and Care Major I **ACP** **10-11** **full year** **4 periods** **5 credits**

Prerequisite: Successful completion of Child Development Exploratory 894

If the Exploratory class sparked interest and excitement regarding working with young children, then this second level child development program is for you! Students will continue to build knowledge and skills by working and studying children in the preschool classroom setting. A more in-depth understanding of toddler/preschool aged children will be gained in addition to an emerging concentration on development in relation to the child care environment. Students will continue to observe and assist in the laboratory classroom while beginning to prepare and teach "hands-on" projects with the children. They will also learn about the many career opportunities in the Early Education and Care field (Education Cluster). Research projects will focus on developmental theories, educational philosophies, and early childhood programs; and professional articles will be used to further discuss topics for study in addition to the textbook, *Working with Young Children*, by Joyce Herr.

8964 Early Education and Care Major 2 **H** **11-12** **full year** **8 periods** **10 credits**

896 Early Education and Care Major 2 **ACP** **11-12** **full year** **8 periods** **10 credits**

Prerequisite: Successful completion of Early Education and Care - Major I, 895

Do you think you want to work with children in some capacity as a future career (education, child care, counseling, psychology, pediatrics, nursing, etc.)? If so, then the Early Education & Care Major 2 course is the next logical step! Students will alternate weeks of studying and developing early childhood curriculum in the academic classroom along with working in the toddler/preschool early childhood classroom setting. Students will continue to build on their knowledge and understanding of the development of young children through practical applications and observations. They will be responsible for developing and implementing standards guided curriculum with the children (using formal frameworks) and assisting the teachers in the preschool/toddler classroom. Students will develop a portfolio documenting their curriculum development, class work, and professional development opportunities. Major 2 students will earn a Safety Training Certificate and be registered for embedded PE course to fulfill the prerequisite to participate in the cooperative education workplace learning experience during their senior year.

8974 Early Education and Care Major 3 **H** **12** **full year** **12 periods** **15 credits**


897 Early Education and Care Major 3 **ACP** **12** **full year** **12 periods** **15 credits**

Prerequisite: Successful completion of Early Education and Care - Major 2, 896 or 8964

Early Education and Care Major 3 builds on the competencies learned in Major 2. Students will gain and develop a more in-depth understanding of the early education and care profession by continuing to alternate weeks of academic class instruction with a greater responsibility and involvement in the preschool lab. In addition, students will study current issues relating to the field, early childhood program policies, licensing laws, and professional expectations and responsibilities. Students will be registered in Early Childhood Physical Education course (034) to fulfill Infant/Child CPR and First Aid certification requirements OR the Career Fitness PE course (033) for adult CPR and First Aid certification - this is included during the 12 blocks. Upon successful completion of the Major 2 and 3 in the Early Education and Care program, students will be eligible to apply for state certification in Early Education and Care.

Graphic Communications – CIP CODE: 100301

932	Exploratory Graphic Communications	no level	9-10	F or S	4 periods	2.5 credits
93211	Exploratory Graphic Communications	no level	11-12	F or S	4 periods	2.5 credits

 This course introduces students to a variety of graphic communications techniques. Students will design a personal crest, memo pads, school poster, T-shirts, and note cards. We'll also have fun with a class project in Photoshop and Illustrator. We explore the Adobe Creative Suite: InDesign, Photoshop, Illustrator, Acrobat software on Macintosh computers. Students will produce work on digital 1-color and 4-color printers and learn how to silk screen on T-shirts.

934	Graphic Communications Major 1	ACP	10-11	full year	4 periods	5 credits
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Prerequisite: Successful completion of Graphics Communication Exploratory – 932

The Major 1 will build on the skills and techniques developed in the exploratory class and students will begin producing work for clients in the school and community as well as do individual class projects. They will learn how to use the large format printer, develop customer service skills, learn project estimating and pricing. Teamwork and problem solving are big themes of this course. Class projects vary and may include personal business card, large poster, two color t-shirts, children's book as well as various client projects. They will be introduced to the career opportunities within the Arts and Communications Cluster.

9354	Graphic Communication Major 2	H	11-12	full year	8 periods	10 credits
935	Graphic Communication Major 2	ACP	11-12	full year	8 periods	10 credits

Prerequisite: Successful completion of Graphic Communication Major 1 – 934

Building on the skills and techniques developed in the Major 1 course of study, students will produce client work, design calendars, program brochures, posters, and work on larger scale projects (elementary school yearbooks, saddle stitched brochures, marketing programs with multiple pieces) that cover all-aspects of the industry. Learning how to let go of your ideas and embrace your customer's is an important step in the graphics communications world. Students will interact with customers more often and will have the opportunity to follow projects from inception to completion including all design iterations in between.


9364	Graphic Communication Major 3	H	12	full year	12 periods	15 credits
936	Graphic Communication Major 3	ACP	12	full year	12 periods	15 credits

Prerequisite: Successful completion of Graphic Communications Major 2 – 935 or 9354

Major 3 students will focus more on working independently and working with clients. They will gain design experience and learn different techniques and skills required to transform rough ideas into finished printed products. Working one-on-one with clients, they will review needs and specifications, design concepts, generate layouts, typeset copy, and follow their projects through production and final billing. While expanding the complexity of projects produced and software we used they will also be exposed to various output devices including plate maker, offset press, digital printers, and finishing equipment. Client work expands soft skills such as customer service, managing expectations, and asset and project management. Students will also have the opportunity to visit various commercial and graphic communications facilities.

TV Media Arts – CIP CODE: 500401

173	Exploratory TV Media Arts	no level	9-10	F or S	4 periods	2.5 credits
17311	Exploratory TV Media Arts	no level	11-12	F or S	4 periods	2.5 credits

 This class provides students with the opportunity to develop into creative professionals and media artists, working with image and sounds to entertain, inform, persuade, and challenge, using state-of-the-art multimedia equipment. Students will learn the fundamental aspects of visual storytelling to create multiple original short films and news stories. Working in teams, they either report stories on camera or direct from behind the scenes to shoot, edit, and weave together short video segments. Projects will take students from the traditional classroom setting to new environments where they'll conduct authentic learning by capturing stories throughout the school.

175	TV Media Arts, Major 1	ACP	10-11-12	full year	4 periods	5 credits
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Prerequisite: Successful completion of TV Media Arts Exploratory 173

In Major 1, students engage in a variety of projects and explore new genres of film while building on skills learned in the previous level of the program. Assignments will include documentary segments, PSAs, commercials, and studio news broadcasts. Through these projects, students will learn script writing, interview techniques, news anchoring, live studio filming, and control room directing. Students can gain additional experience by filming school functions and events. These filming opportunities are often paid positions where qualified students earn money. Each production will air on NNTV's YouTube channel. The most successful creations will air on Newton's local access education channel, NewTV. This class meets four times a week.

1764	TV Media Arts, Major 2	H	11-12	full year	4 periods	5 credits
176	TV Media Arts, Major 2	ACP	11-12	full year	4 periods	5 credits

Prerequisite: Successful completion of Intermediate TV Media Arts Major 1 175

Major 2 students will create content for multiple NNTV shows. Each week students will work together in crews to produce the live studio news show, Newton North Update, which will air live during homeroom. Students will also pitch ideas, contact sources, conduct interviews, film video and travel to new locations throughout and around our community to capture short documentary segments for the show Tiger Vision. This semi-monthly show will air on NewTV, and NNTV's YouTube channel. Students segments may be entered into local and national film competitions. At the completion of this class, students will have gained the skills, knowledge, and experience needed to advance into a college level program or seek gainful employment in this rapidly growing field.

1784 TV Media Arts, Major 3	H	12	full year	8 period	10 credits
178 TV Media Arts, Major 3	ACP	12	full year	8 period	10 credits

Prerequisite: Successful completion of TV Media Arts Major 2 176 or 1764, with a grade of 80 or above and be recommended by the teacher.

In Major 3, students will have the freedom to work on their own productions spanning any genre of their choosing and produce college media arts portfolios. Students will also run their own independent production companies by designing projects for clients throughout the city. As producers, students foster skills developed in leadership, communicating with clients, time management, film scheduling, meeting deadlines, and giving professional presentations. Skills associated with TV Media Arts are increasingly sought after in today's competitive market. Upon completion of this curriculum, students are fully equipped with authentic experience and a strong technical skill set for the pursuit of any career.

Technology/Engineering

959 Engineering 1	ACP	10-11-12	F	4 periods	2.5 credits
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Pre-requisite: Students must have passed or currently be enrolled in SIMMS, Math 501, Math 511, Math 517, or Math 543.

This course is designed to expose students to some of the many forms of engineering. In this class the students will learn extensively about Electrical Engineering and other forms of Power Technology. The students will design and develop working electronic circuits and be able to calculate resistance, voltage and current using Ohm's law and Kirchhoff's current and voltage laws. The students will build and test circuits that contain resistors, capacitors, diodes, transistors, and small integrated circuits. The students will use and understand certain test equipment such as multi-meters and oscilloscopes. High voltage residential wiring techniques will also be covered.

This course, along with "Engineering 2," is ideal for students exploring the field of engineering as a career pathway.

960 Engineering 2	ACP	10-11-12	S	4 periods	2.5 credits
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Pre-requisite: Students must have passed or currently be enrolled in SIMMS, Math 501, Math 511, Math 517, or Math 543.

This course is designed to expose students to some of the many forms of engineering. In this class the students will explore Mechanical and Structural engineering concepts in some depth. In the Mechanical Engineering portion of this class the students will learn about gearing, pulleys, and lever systems. Students will be using SolidWorks and C.N.C. machinery to manufacture individual projects that they themselves have engineered to meet certain criteria. In the Structural Engineering portion of this class the students will learn about the many processes of design construction. The students will learn about the various techniques of engineering roof trusses, and floor beams to be able to carry dead and live loads. Using a variety of materials the students will be able to build and test scale model trusses and beams to determine the amount of loads they can handle.

961 Honors Engineering 3	H	10-12	full year	4 periods	5 credits
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Pre-Requisite - Students must have successfully passed Engineering 1 and 2. Students who complete this course will learn the engineering methods and skills involved in the production of consumer grade goods. The students will build upon and increase their knowledge of Physics, Chemistry, Electrical, Mechanical and Manufacturing Engineering to design various projects throughout the year. They will be working as members of cooperating engineering teams to design, engineer, and produce products that could be mass manufactured. The students will learn engineering design techniques such as the Axiomatic Design Process, methods of mass production, and safe handling of production equipment, i.e., lathe, mill, CNC equipment, robotics, vacuum forming, and injection molding. A large portion of this class will also focus on the methods of project management.

636 Engineering Technology	ACP	9-10-11-12	full year	4 periods	5 credits
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Students will learn important technological and engineering related skills and concepts. These concepts cover Engineering Design, Construction Technologies, Communication Technologies, and Energy and Power Technologies (Fluid, Thermal and Electrical systems). Students will be designing, building and testing prototype models that cover these concepts. Students will learn product design, accurate measurements using a variety of instruments and technologies, application of algebra to engineering problems, and application of physics concepts to the real world. This course is aligned with the MA State Frameworks for Science and Technology/Engineering and will allow the students to choose to take the MCAS for Technology/Engineering if they wish. Successful completion will meet the physical science requirement.

963 Exploring Technology 1	no level	9-10-11-12	F	2 periods	1.25 credits
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This course will be taught as a hands-on project-based course where the students will learn about Electrical/Power Technology, Mechanical Technology, and Manufacturing Technology. Through the building and testing of projects, students will learn the concepts behind these technologies.

964 Exploring Technology 2	no level	9-10-11-12	S	2 periods	1.25 credits
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This course will be taught using a hands-on approach similar to Exploring Technology I. The students will learn about Transportation Technology, Communications Technology, and Structural Technology by designing, building and testing small projects.

965 Robotics 1	no level	9-10-11-12	F or S	2 periods	1.25 credits
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967 Robotics 2	no level	9-10-11-12	F or S	2 periods	1.25 credits
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Prerequisite: 965 is a prerequisite for 967

Robotics is a hands-on building and demonstration course. In small groups the students design, build and program robots to perform specific tasks. The tasks start simple and progressively get more complicated throughout the course. Some of the topics that will be covered are: Simple machines, Gear and Pulley Systems, Transmission Systems, and Computer Programming. We will be using Lab View programming language. Robotics 2 is a continuation of Robotics 1. The projects will get more complicated with the addition of new sensors and programming techniques.

968 Honors Robotics 3	H	10-12	full year	4 periods	5 credits
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Pre-requisite- Students must have successfully passed Robotics 1 and 2 with a C or better, or permission of the instructor.

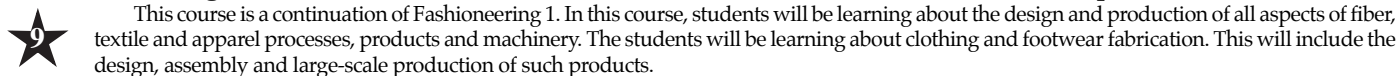
In this course students will develop a strong understanding of industrial robotic automation. They will learn mechanical design, electrical and electric circuit fabrication, electronic control systems, motor control systems and programming in multiple languages including, Python, C++, Arduino, and Lab View. U - on completion of this course the students will be able to design, build, program, and trouble shoot custom made robots.

976 Fashioning 1	no level	9-10-11-12	F	2 periods	1.25 credits
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Fashion Engineering "Fashioning" will be taught as a hands-on project based course where students will apply scientific and engineering principles to the design and production of all aspects of fiber, textile and apparel processes, products and machinery. The use of systematic problem solving engineering principles within the fashion design process will be used extensively throughout the entire course. The students will be creating 3D models, jewelry and accessories.

977 Fashioneering 2**no level 9-10-11-12 S 2 periods 1.25 credits**

 This course is a continuation of Fashioneering 1. In this course, students will be learning about the design and production of all aspects of fiber, textile and apparel processes, products and machinery. The students will be learning about clothing and footwear fabrication. This will include the design, assembly and large-scale production of such products.

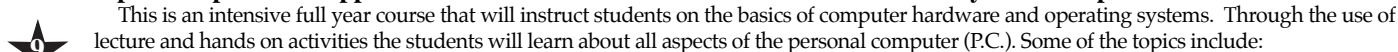
969 Engineering Research Project 1-2 -Major 1**ACP 10-11-12 F or S 2 periods 1.25 credits****971 Engineering Research Project 3-4 -Major 2****ACP 10-11-12 F or S 2 periods 1.25 credits**

Pre-Requisite: Permission of the instructor

This course is designed for the self-motivated student who has a strong interest in science and technology/engineering and who has already passed 5 credits of a technology/engineering course.

The students, working in the technology laboratory, will perform a cursory investigation of the many forms of technologies such as, Robotics, Computer Aided Design and Manufacturing, Desktop Publishing, Plastics Technology, Multimedia Design, Electrical and Electronics Technology, Structural Technology and Transportation Technology. Each student will then choose an area of technology/engineering of particular interest to him/her and investigate it in depth. The students, under the direction of the instructor, will design, develop and complete a semester project in their chosen technology.

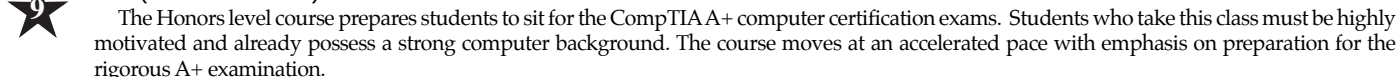
972 Computer Repair and Support**ACP 9-10-11-12 full year 4 periods 5 credits**

 This is an intensive full year course that will instruct students on the basics of computer hardware and operating systems. Through the use of lecture and hands on activities the students will learn about all aspects of the personal computer (P.C.). Some of the topics include:

Hardware Basics: Basic electronics, mother boards, computer cases/power supplies, battery backups, system settings: BIOS, IRQ, I/O, and DMA, CPUs, expansion bus architecture, physical memory, data storage, I/O ports and connectors, I/O devices, printers and scanners, system startup sequences, and portable computers. The operating systems that will be covered are DOS, Windows XP, Vista, Windows 7, and Linux.

973 Honors Computer Repair and Support**H 9-10-11-12 full year 4 periods 5 credits**

(A+ Certification)

 The Honors level course prepares students to sit for the CompTIA A+ computer certification exams. Students who take this class must be highly motivated and already possess a strong computer background. The course moves at an accelerated pace with emphasis on preparation for the rigorous A+ examination.

Engineering Certificate

*Quisque Ipsum***Core Requirements****Complete ALL credits from the following courses****Engineering Core Requirement**

965	Robotics 1	1.25 Credits
967	Robotics 2	1.25 Credits
959	Engineering 1	2.5 Credits
960	Engineering 2	2.5 Credits
Sub Total		7.5 Credits

Design Core Requirement

656	Engineering Design	1.25 Credits
OR		
911	Drafting Exploratory	2.5 Credits
Sub Total		1.25-2.5 Credits

Science Core Requirement

614, 670, 644	Introductory Physics	5 Credits
602, 612, 622	Chemistry	5 Credits
611, 621, 641	Biology	5 Credits
603, 607, 613, 623	Physics	5 Credits
Sub Total		20 Credits

Math Core Requirement

501, 511, 516, 581, 541	Math 1	5 Credits
502, 512, 517, 582, 542	Math 2	5 Credits
503, 513, 518, 583, 543	Math 3	5 Credits
504, 514, 519, 584, 544	Math 4	5 Credits
Sub Total		20 Credits

Math/Science/Technology Electives**Choose a minimum of 5 credits from the following courses****Engineering/Technology Electives**

636	Engineering Technology	5 Credits
961	Engineering 3	5 Credits
963	Exploring Technology 1	1.25 Credits
964	Exploring Technology 2	1.25 Credits
968	Robotics 3	5 Credits
976, 977	Fashioneering 1, 2	1.25 Credits
657	Engineering Design (advanced)	1.25 Credits

Science Electives

605	AP Biology	5 Credits
606, 608	AP Chemistry	5 Credits
630	Anatomy and Physiology	5 Credits
632	Astronomy	2.5 Credits
633	Modern Physics	2.5 Credits
653	Introduction to Sustainability	1.25 Credits
654	Design for Sustainable Communities	1.25 Credits
634	Sustainability & Envi. Science	5 Credits
635	Marine Biology	5 Credits
637	Forensics	5 Credits
638	Organic Chemistry	5 Credits

Computer Science Electives

549	Introduction to Comp. Sci.	2.5 Credits
551, 552	Computer Programing	2.5 Credits
553	Computer Science Principles	5 Credits
868	Website Development	2.5 Credits
864	Interactive Multimedia	2.5 Credits
972, 973	Computer Repair and Support	5 Credits

Career and Technical Education Typical Four-Year Sequence

9th Grade	English 4 Blocks per Week	World History 4 Blocks per Week	Physics 4 Blocks per Week	Math 4 Blocks per Week	World Language Academic Study 4 Blocks per Week	PEHW/Study Academic Study 2 Blocks per Week/ per course both Semesters	CVTE Exploratory 4 Blocks per Week per Semester
10th Grade	English 4 Blocks per Week	World History 4 Blocks per Week	Chemistry 4 Blocks per Week	Math 4 Blocks per Week	World Language Academic Study 4 Blocks per Week	PEHW/Study Academic Study 2 Blocks per Week/ per course both Semesters	CVTE Major 1 4 Blocks per Week
11th Grade	English 4 Blocks per Week	United States History 4 Blocks per Week	Biology 4 Blocks per Week	Additional Math, World Language, Elective or Academic Study	Additional Math, World Language, Elective or Academic Study	CVTE Major 2 includes PHEW	CVTE Major 2 8 Blocks per Week
12th Grade	English 4 Blocks per Week	PEHW/Study Academic Study 2 Blocks per Week/ per course both Semesters	Additional Math, World Language, Science, History, Elective or Academic Study	Additional Math, World Language, Science, History, Elective or Academic Study	CVTE Major 3 includes Entrepreneurship	CVTE Major 3 12 Blocks per Week	CVTE Major 3 12 Blocks per Week

9th Grade - Exploratory Program - 4 Blocks per Week - 1 Semester (students can take the Exploratory Program both Semesters)

10th Grade - Major 1 - after completing the Exploratory Program students can apply to become a Major 1 - 4 Blocks per Week - Full Year

11th Grade - Major 2 - after completing the Major 1, students can advance to the Major 2 - 8 Blocks per Week (includes PEHW) - Full Year

12th Grade - Major 3 - after completing the Major 2, students can advance to the Major 3 - 12 Blocks per Week - Full Year