# Bristol TEC Program of Studies

## TRADE PROGRAMS
## Automotive Technology

The Automotive Technology program at Bristol TEC is a one-year intensive program, and covers the diagnosis and service techniques for motor vehicles. Instruction deals with the repair and servicing of engines, transmissions and carburetors. Students learn to do tune-ups and receive training on electrical systems, brakes and front ends.

The first semester consists of a laboratory program where theory instruction is combined with practical application on operational jobs and projects. The students will gain a thorough knowledge of the materials and equipment used by auto mechanics. In addition, the student will learn to use meters and measuring instruments to interpret sketches, schematics and diagrams and to use shop manuals and other instructional materials.

The second semester consists of theory programs with actual service and repair of late model customer-owned vehicles. The student works in a garage atmosphere under the supervision of an instructor.

Upon completion of the Automotive Technology program at Bristol TEC, the student receives a 900-clock hour certificate, which may be used toward an apprenticeship in the field.

In addition, high school students can earn up to seven credits toward their high school graduation when they successfully complete their trade course as well as academic classes required by their sending school. Academic classes offered for credit at Bristol TEC are: English, Trade-related Math or Algebra II, Civics, U.S. History and Psychology. It is the responsibility of the student (and parent) to stay in contact with the sending school guidance department to ensure all graduation requirements are being met. Students may need Physical Education, Health or other credits and will need to plan to complete these outside of the school day at Bristol TEC.

Work-based Learning is available to qualified students. This gives the student an opportunity to work in the field at local automotive companies and receive credit for their work.

ADVANTAGES

Working conditions are good and employers often send mechanics for advanced or special training. Upon completion of this program there are several opportunities in specialty areas such as transmission, rear end and engine overhauls. With the basic skills learned in this program and further training, the student could pursue computer diagnostics.

JOB OUTLOOK

The future looks good for those interested in automotive technology. The work is becoming increasingly technical, requiring experience and well-trained workers. The industry offers many opportunities in areas such as:

- Shop Foreman
- Shop Owner
- Service Station Operators
- Car Dealers
- Service Writer Supervisor
- Distribution

PLACEMENT

Bristol TEC students have been placed in area dealerships, small automotive repairs shops, parts distribution centers or have continued in advanced training programs.

# Culinary Arts

Students train to enter the culinary arts field as apprentice cooks, chefs or bakers in the hotel and restaurant industry. The course provides instruction and learning experiences in the daily lunch program, in which planning and preparing menus on a weekly basis is stressed. Instruction emphasizes recipes, proper food preparation, baking, ordering, inventory control, dining room management and banquet and catering services.

The total program is planned to raise the level of student proficiency through both mass production and individual dining experiences. A modern cafeteria kitchen serves as the training area for this program. Each student is expected to provide various supplies and to gradually acquire a complete set of personal culinary tools and the appropriate uniforms for the culinary arts trade.

ADVANTAGES OF THE TRADE

A wide variety of job opportunities are available in areas of food preparation and baking for restaurants and institutions. The work is interesting and employment opportunities are expected to grow well into the next century.

Upon completion of the Culinary Arts (Food Trades/Baking) program at Bristol TEC, the student receives a 900-hours certificate, which can be credited toward a state apprenticeship as a baker or chef in the culinary field.

In addition, high school students can earn up to seven credits toward their high school graduation when they successfully complete their trade course as well as academic classes required by their sending school. Academic classes offered for credit at Bristol TEC are: English, Trade-related Math or Algebra II, Civics, U.S. History and Psychology. It is the responsibility of the student (and parent) to stay in contact with the sending school guidance department to ensure all graduation requirements are being met. Students may need Physical Education, Health or other credits and will need to plan to complete these outside of the school day at Bristol TEC.

Selected students may be offered the opportunity to continue their training at Bristol TEC for a second year at a more intensive level. Work-based Learning is available to qualified students. This gives students an opportunity to work in the field at local facilities and receive credit for their work.

PLACEMENT

Bristol TEC students have been placed in areas such as nursing homes, restaurants, catering businesses, and bakeries. Starting salaries range from $9.50 to $15.50 per hour, depending upon the individual's ability.

JOB OUTLOOK

The future looks extremely promising for those interested in the Culinary Arts area. The work is becoming increasingly specialized requiring experience and well-trained workers. The culinary industry offers many opportunities in areas such as:

- Restaurant Chefs and Institutional Chefs
- Butcher and Meat Cutters
- Fast Food Cooks
- Bread and Pastry Chefs
- Food Workers in Grocery Stores
- Restaurant and Hotel Food Service Managers
- Prep Cooks and Line Cooks
- Cafeteria Cooks
- In Plant Feeding

Besides placement in local restaurants, hospitals and nursing facilities, a number of graduates of the Culinary Arts program have continued their education on the college level in the Hotel Management and Resort Management fields.

# Electronics Technology

The Electronics Technology program is a one-year intensive program that covers basic DC and AC theory, motors, semi-conductors, digital electronic circuits, troubleshooting and repair of electronic equipment including personal computers. PC operating systems and Internet access will also be practiced.

Students will become proficient in the use of tools and test equipment used in the electronic industry including digital multi-meters and oscilloscopes. They will be able to draw and interpret complex electronic schematics in order to build, install or troubleshoot equipment. They also will be able to upgrade and repair personal computers.
These skills are practiced through laboratory assignments and personal projects, which vary and include the following: audio/video installation and repair, PC use and repair, consumer electronic repair, electric vehicle design and other like activities.

ADVANTAGES OF THE TRADE
The training is diversified and will prepare the student to become competent in this field as an entry-level technician.

On completion of the program at Bristol TEC., the student receives credit for 900-clock hours, which may be credited toward a state-approved apprenticeship.

In addition, high school students can earn up to seven credits toward their high school graduation when they successfully complete their trade course as well as academic classes required by their sending school. Academic classes offered for credit at Bristol TEC are: English, Trade-related Math or Algebra II, Civics, U.S. History and Psychology. It is the responsibility of the student (and parent) to stay in contact with the sending school guidance department to ensure all graduation requirements are being met. Students may need Physical Education, Health or other credits and will need to plan to complete these outside of the school day at Bristol TEC.

Selected students may be offered the opportunity to continue their training at Bristol TEC for a second year at a more intensive level.

Work-based Learning is available to qualified students. This gives students an opportunity to work in the field at local facilities and receive credit for their work.

JOB OUTLOOK
Jobs in this trade area fit the following types of activity:

- PC Repair
- Electronic Assembly
- Electronic Engineering Technician
- Copier Repair
- Biomedical Equipment Repair
- Security System service Technician
- Video Installation and Repair
- Audio Installation and Repair
- Industrial Equipment Service
- Electrical Apprentice
- Computer Numerical Controls Repair
- Electrical Technician

All indications are that this career area should probably be one of the fast, growing occupational fields. With the growth of the newer levels of technology spreading into every facet of modern life, the need for digital electronics skills will only increase.

# Heating, Ventilation, Air Conditioning and Refrigeration (HVAC/R)

The Heating, Ventilation, Air Conditioning (HVAC/R) and Refrigeration program is concerned with the broad area of environmental systems control. HVAC/R is two-year intensive course of study in the general trades areas of refrigeration, air-conditioning, sheet metal and heating and ventilation. Projects involve use of various types of refrigeration/air conditioning equipment and heating and ventilation trainers. Safety procedures and proper use of testing equipment are taught in each of these areas. In refrigeration, students learn about typical residential and commercial applications of refrigeration systems. In the air conditioning area, students are instructed on central air systems as well as window air conditioning units. In heating and ventilation, students are involved with boilers, burners, ventilation systems and total environmental control applications. Students learn to assemble various types of piping using acetylene and oxygen torches and various solders and fluxes used in the installation of refrigeration and air-conditioning systems. Uses of various refrigerants and fuel heating oils are also covered. In each area, students cover the basics of each system and learn to assemble and troubleshoot the various devices necessary for the systems. The student will become familiar with the mechanical and electrical components necessary to work in the field. Students learn Environmental Protection Agency (EPA) rules and regulations about refrigeration containment and needs for certification. Certification testing is provided at the school twice a year (fall & spring).

ADVANTAGES OF THE TRADE

The HVAC/R specialist may work alone, with a team, work indoors, outdoors, travel or stay in the office and manage the business. This field offers full-time work year round. There is a variety of work exposure as one moves from one location to another. HVAC/R is an apprentice trade involving certified training hours. On completion of the program at Bristol TEC, the student receives 900-clock hours per year, which may be credited toward a state-approved apprenticeship in the field.

In addition, high school students can earn up to seven credits toward their high school graduation when they successfully complete their trade course as well as academic classes required by their sending school. Academic classes offered for credit at Bristol TEC are: English, Trade-related Math or Algebra II, Civics, U.S. History and Psychology. It is the responsibility of the student (and parent) to stay in contact with the sending school guidance department to ensure all graduation requirements are being met. Students may need Physical Education, Health or other credits and will need to plan to complete these outside of the school day at Bristol TEC.

Interested and qualified students may be offered a placement with the Work-based Learning program. This gives students an opportunity to work in the field at local facilities and receive credit for their work.

JOB OUTLOOK

The supply of trained people has not kept pace with the rapidly increasing demand for HVAC/R technicians. It is estimated that at least 75,000 more trained HVAC/R specialists will be needed in the next few years in the industry.

PLACEMENT

Students that complete the program can become apprentices to the trade and work in area heating, air conditioning and refrigeration businesses. Students earn from $10.00 to $14.00 an hour. Journeyman licensed HVAC/R specialists average $15.00 to $18.00 an hour. Many people who enter this field find they can move into other areas of industry, such as:

- Sales Representatives
- Estimator
- Draftsman
- Designer
- Specification Writer
- Field Service Person
- Lab Technician
- Wholesale Operations

# Manufacturing Technology

The Manufacturing Technology Program provides instruction on metal millers, grinders, lathes and computer-numerical controlled (CNC) machinery. Theory is taught every day and is directed to all phases of information needed to use the various machines and machine accessories, as well as setup and operation procedures. The remainder of the day is project oriented and students make the tools necessary for the trade.

Training includes the use of various accessories, such as the milling vise, dividing head, rotary table and angle iron. Students are taught the use of a large variety of measuring tools, such as the micrometer, vernier, gauge block and indicator.

ADVANTAGES OF THE TRADE
A wide variety of job opportunities are available from semi-skilled to professional-level jobs. Some of those jobs might require further education and/or training.

The work is interesting and the field is considered highly technical.

Upon completion of the program at Bristol TEC, a student receives a certificate worth 900 credit hours toward a state-approved apprenticeship program.

In addition, high school students can earn up to seven credits toward their high school graduation when they successfully complete their trade course as well as academic classes required by their sending school. Academic classes offered for credit at Bristol TEC are: English, Trade-related Math or Algebra II, Civics, U.S. History and Psychology. It is the responsibility of the student (and parent) to stay in contact with the sending school guidance department to ensure all graduation requirements are being met. Students may need Physical Education, Health or other credits and will need to plan to complete these outside of the school day at Bristol TEC.

Selected students may be offered the opportunity to continue their training at Bristol TEC for a second year at a more intensive level. Work-based Learning is available to qualified students. This gives students an opportunity to work in the field at local facilities and receive credit for their work.

JOB OUTLOOK
The world is rapidly moving into the era of total technology and someone must make the machines that create the technology. Machinists are those workers.

Employment opportunities for machinists or tool and die makers will increase significantly every year, well into the next century. Opportunities for numerical control machine-tool operators are expected to increase faster than average. Computer numerical controlled operators and machinists are in high demand.
Jobs in this trade area are:

- CNC Programmer
- Metalworking Machinist
- Industrial Machinist
- Aircraft and Parts Machinist
- Plastic-working Machine Operator
- Tool and Die Maker
- Instrument Maker

PLACEMENT
Bristol TEC students have been placed in a variety of areas including machining, tool and die apprenticeship, computer-controlled machinery and machine maintenance. Many of our students continue their technical education and enter the fields of programming for computer-controlled machining and manufacturing engineering. Starting salaries range from $9.50 to $21.00 per hour, depending on the individual's ability.

# Welding and Metal Fabrication

The Welding and Metal Fabrication trade is a very important part of industry and construction trades.

The Welding and Metal Fabrication program at Bristol TEC is a one-year intensive training program. Those who successfully complete the training may convert the 900-clock hours credit toward a state-approved apprenticeship-training program.

In addition, high school students can earn up to seven credits toward their high school graduation when they successfully complete their trade course as well as academic classes required by their sending school. Academic classes offered for credit at Bristol TEC are: English, Trade-related Math or Algebra II, Civics, U.S. History and Psychology. It is the responsibility of the student (and parent) to stay in contact with the sending school guidance department to ensure all graduation requirements are being met. Students may need Physical Education, Health or other credits and will need to plan to complete these outside of the school day at Bristol TEC.

Selected students may be offered the opportunity to continue their training at Bristol TEC for a second year at a more intensive level.

Students receive instruction in shop math, blueprint reading and welding safety. Students receive training in the following welding skills: oxyacetylene welding, cutting and brazing, shielded metal-arc welding, gas metal-arc welding and tungsten arc welding. Students will also be exposed to fabrication and repair using various types of metal. Students who successfully complete the course will be eligible for certification testing.

After learning the basics at Bristol TEC students can continue their training in:

- Aircraft Welding
- Bridge Welding
- Pipeline Welding
- Auto Body Welding
- Artistic Welding
- Fabrication
- Underwater Welding
- Shipyard Welding
- Blacksmith/Forging
- Forge Shop Workers
- Boilermaker

ADVANTAGES OF THE TRADE

The welder may work alone or with a team, work indoors or outdoors, travel or operate their own business. Most welders work year-round and can be exposed to a variety of work locations. After graduation you may wish to join an apprenticeship program or if you have the ability and the interest, go directly to work as a journeyman or an independent welder.

Welders usually receive from $ 9.00 to $12.00 an hour to start. Experienced welders can expect between $12.00 to $31.00 an hour.

JOB OUTLOOK

The job outlook is and has been good for all previous students who wanted to enter the trade. The Department of Labor forecasts indicate that the trade will remain at the same level of opportunity for the foreseeable future.

Welding students have an excellent placement record, both inside and outside of the state of Connecticut.

# Academic Classes

Academic classes are available for high school students at Bristol TEC and are taken based on sending school diploma requirements. Prior to the start of the school year, sending school counselors submit a course request for each student. Because students are primarily in their technology areas they cannot take more than one of each academic subject per year and therefore must have enough credits to qualify for a junior/senior student in good standing. All high school students who successfully pass all the enrolled courses during the school year will earn seven credits towards their high school diploma at their sending schools. The total number of credits earned in trade by high school students is based on time in shop (or seven credits) minus the number of academic credits they are enrolled.

Academic classes available for students:

**English (1 CREDIT)** at Bristol TEC focuses on the development and refinement of reading, writing and communication skills. Students will survey a variety of American and world literature while analyzing the relationship between culture and literature. The course will also examine the role of technology in communication and its influence on the English language. Reading materials will be provided during the school year.

**Mathematics Application (1 CREDIT)** concentrates on solving mathematical problems that are applicable to the trades. Instruction may include but is not limited to skill development in the following areas: basic math operations with whole numbers, fractions, decimals, percent, ratio and proportions and right angle trigonometry. The use of scientific calculators will also be taught. Successful completion of the course will ensure that students have sufficient knowledge to solve trade-related math problems. All students are enrolled in math applications, but may attempt to 'test out' of the course as long as they do not need the math credit to graduate. Inquire with the guidance office if interested in higher math opportunities through your local community college tuition-free.

**Modern United States History (1 CREDIT)** focuses on major historical periods, issues and trends in U.S. History from the 20th century to the present. Students examine historical themes such as ideals, beliefs, institutions, conflict resolution, science and technology in order to understand how the United States came to be the way it is. The course emphasizes the economic, political and social events that shaped our nation. Students will develop historical thinking through active inquiry and research using multiple sources. Students will evaluate multiple perspectives and interpretations through the use of primary sources in order to develop important skills such as analysis of the information presented in multiple formats.

**Civics/American Government (.5 CREDITS/FALL SEMESTER)** prepares students to participate in exercising their political responsibilities as thoughtful and informed citizens. Civics provides a basis for understanding the rights and responsibilities for being an American citizen and a framework for competent and responsible participation. Emphasis is placed on the historical development of government and political systems as well as the importance of the rule of law; the United States Constitution; federal, state and local government structure; and the rights and responsibilities of citizenship. Students will actively investigate local, state and national issues, read and participate in discussions and develop informed opinions using a variety of writing forms.

**Psychology (.5 CREDIT/SPRING SEMESTER)**: Psychology is the scientific study of behavior and mental processes. In Psychology, students are introduced to the historical development of psychology and the scientific study of behavior and mental processes. Students will learn about personality development, learning theory, biological bases of behavior, heredity versus environment, memory, abnormal psychology and current

mental health issues. Students will take part in discussions, experiments, group projects, demonstrations and exercises designed to better understand how people think, feel and do. The purpose of this course is to give students an understanding of social behavior and attitudes as well as the skills to address critical problems of the individual and society.