APPENDIX V

New Jersey Council of County Vocational-Technical Schools | CAREERTECHNJ
132 West State Street, Trenton, New Jersey 08608 | (609) 392-6222 | www.careertechnj.org

Manufacturing-Related Programs
New Jersey County Vocational-Technical Schools

New Jersey's 21 county vocational-technical schools offer a wide range of career programs that have direct application to manufacturing industries in New Jersey.

- Engineering/STEM
- Computer assisted design (CAD)
- Machine technology and repair
- Logistics and supply chain management
- Welding
- Mechatronics
- Diesel and auto technology
- Computer programming and repair

Programs with a specific focus on manufacturing:

Bergen County Technical Schools - Applied Technology High School

Opened in September, 2015, Applied Technology High School provides students with a unique educational experience through a blend of academic high school curriculum, college classes, and hands-on technical education.

With a curriculum centered on "smart machines," students learn to apply math, science, and technology to hands-on projects in the fields of automation, electronics, and advanced manufacturing. They also learn the essential skills they need to pursue careers in a wide variety of areas, including engineering technology, and benefit from dual-enrollment coursework that allows them to earn advanced standing in several technical associates degree programs at Bergen Community College, including an A.A.S. program in General Engineering Technology.

People with a degree in engineering technology will help fill a critical workforce need: They will be installing, maintaining and supporting the increasing number of automated manufacturing systems that are projected to return much of the production that has been outsourced over the past decade back into factories here in the U.S. Graduates from a two- or four-year program in engineering technology qualify as technicians and seek employment in a variety of sectors including manufacturing, construction, and production design.
Contact: Andrea Sheridan, Assistant Superintendent, andshe@bergen.org, 201-343-6000

Burlington County Institute of Technology – Advanced Manufacturing and Fabrication

Operated through a partnership with Rowan College of Burlington County at BCIT's Medford campus, the new Advanced Manufacturing and Fabrication Program includes a general overview of the manufacturing industry and advanced manufacturing processes, as well as specific coursework in CNC, computer assisted design (CAD), machining, and welding, all aligned with a rigorous academic program.

BCIT high school students take their classes at the center during the day; in the evenings, adult students receive instruction though a program jointly operated by BCIT and RCBC. Rowan University and industries like Westampton-based Inductotherm are also involved with the program.
Contact: Dr. Todd Bonsall, Assistant Superintendent, tbonsall@bcit.cc, 609-267-4226

Camden County Technical Schools – Pre-engineering/Industrial Track

This pre-engineering program enables students to experience applied practices in civil, mechanical, computer, environmental, industrial, and electrical engineering. Students use computers, engineering graphics, testing devices and equipment, and math/science principles in a laboratory setting to solve the real-world problems that confront engineers.

This program emphasizes problem solving, critical thinking, and the development of strong communication skills and the legal and professional ethics of engineering, and focuses on the engineering practices of designing, analyzing and improving new and existing designs, as well as teaching design and programming.

During their junior year, students have the option to specialize in one of three areas: 1) Computer Integrated Manufacturing (CIM), the design and programming of Computer Numeric Control (CNC) devices, Rapid Prototyping, and 3D Rendering;, 2) Digital electronics, automation and Programmable Logic Controllers (PLCs); or 3) Civil Engineering, Architecture and Computer-Aided Design (CAD).
Contact: Patricia Fitzgerald, Superintendent, pfitzgerald@ccts.tec.nj.us, 856-767-7000

Cape May County Technical School District – Manufacturing-Related Programs

The Cape May County Technical School District's welding program trains students in the use of the oxy-acetylene process, metal cutting, welding, brazing and soldering, with various types of arc welding. High school students have the opportunity to attain an American Welding Society (AWS) certification and college credits.

The district also offers a range of evening arc welding classes for adult skill development through our continuing education division. The district plans to open a new twilight evening post-secondary program that will help adult students gain industry aligned CTE skills and attain additional industry manufacturing certification.

Manufacturing is also infused in the district's Project Lead The Way Curriculum through the addition of 3-D design and printing, utilizing STEM-based curriculum, along with next year's planned addition of laser engraving. From boat-building to bridge construction to computer design and development, manufacturing is alive and well in Cape May County.
Contact: Dr. Nancy Hudanich, Superintendent, nhudanich@capemaytech.com, (609) 465-2161

Hudson County Schools of Technology – D-FAB: Design, Fabrication and Mechatronics

This new program, focused on design, fabrication and mechatronics, will grow the next generation of technology workers through skill development and flexible degree pathways.

With multiple access points and degree/training options for learners from high school through college, the program has been planned and implemented in collaboration with employers such as Eastern Millwork and higher education partners including Hudson County Community College, NJ City University and NJIT. The program will utilize the dual training model employed in Germany, through which students will learn in school and on the job.
Contact: Alyson Krone, Assistant Principal, akrone@hcstonline.org, 201-662-6809

APPENDIX V

Mercer County Technical Schools – STEM Academy

The Mercer County Technical School District launched a four-year, full-time STEM (science, technology, engineering and math) Academy in September 2015, thanks to a $300,000 county vocational partnership grant from the New Jersey Department of Education. A partnership with Mercer County Community College, the STEM Academy provides Mercer County high school students with an academically challenging and rigorous curriculum that includes a strong manufacturing focus.

The program incorporates Project Lead The Way, an activity-, project-, and problem-based engineering curriculum that includes computer-integrated manufacturing and electronics. Students have the opportunity to earn up to 34 college credits in courses such as computer-assisted design, industrial measurement and machining.

Contact: Sharon Nemeth, Principal, Assunpink Center, snemeth@mcts.edu, 609-586-5144

Middlesex County Vocational and Technical Schools – Pre-Engineering and Manufacturing Technology

Recognizing the need for a secondary-level advanced manufacturing program in the county, MCVTSs opened a Pre-Engineering and Manufacturing Technology career major in September 2015 at the East Brunswick campus.

Thanks to consultation with businesses and industries across the county and state, this program prepares students to apply basic technical skills and basic engineering principles to the installation, troubleshooting and support of the production process for a wide array of automated manufacturing employers.

The Pre-Engineering and Manufacturing Technology program includes instruction on tools, materials, production process, machine operations, automated line operations, technical and quality control, engineering analysis, instrumentation, programmable logic controllers (PLCs), electronics, hydraulics and pneumatics, process control, computer aided design (CAD), computer-aided manufacturing (CAM), and robotics.

Contact: Sean McDonald, Supervisor of Career and Technical Education, mcdonalds@mcvts.net, 732-257-3300

Monmouth County Vocational School District – Advanced Manufacturing & Robotics

Monmouth County Vocational School District, in partnership with Festo Didactic, Inc.,will be offering an Advanced Manufacturing & Robotics shared-time program for high school juniors and seniors in starting in the fall of 2017.

The program will be taught on the site of Festo Didactic Inc., in Eatontown, providing an authentic learning experience. Students will engage in a rigorous curriculum, including an *Introduction to Engineering, Material, Properties & Processes, Engineering Graphics with CAD, Robotics & Automation.* They will also have the opportunity to earn industry-recognized certifications and participate in hands-on experiences and structured internships.

This is a unique opportunity to engage and prepare high school students for careers in advanced manufacturing, engineering and robotics while addressing the recognized skills gap in the manufacturing industry.

Contact: Denise Kebeck, Principal, dkebeck@ctemc.org, 732-431-7942.

APPENDIX V

Morris County Vocational School District – Engineering Design and Advanced Manufacturing

The Engineering Design and Advanced Manufacturing (EDAM) program offers high school juniors and seniors the opportunity to take classes in engineering, computer science, electronics and other technology applications while earning 32 college credits before high school graduation. Students also earn County College of Morris Certificates of Achievement in Mechanical Computer Aided Drafting and Engineering Technology.

Students take all their classes at the County College of Morris (CCM), where they work in CCM's newly-remodeled engineering while obtaining the key skills they need for careers in this rapidly expanding field.

Program partners include the Manufacture NJ Talent Network, the New Jersey Business & Industry Association, National Manufacturing Company, Siemens HealthCare and the New Jersey Manufacturing Extension Program. These partnerships provide students with work-based learning experiences to gain hands-on training and an inside track to employment opportunities upon program completion.

EDAM graduates also have the option of continuing at CCM to earn an associate's degree in Mechanical Engineering Technology in just one year. Students earning this degree will then be able to transfer to New Jersey Institute of Technology and earn a bachelor's degree in Engineering Technology or a related field.
Contact: Shari Castelli, Assistant Superintendent, castellis@mcvts.org, 973-627-4600 X206

Ocean County Vocational Technical Schools – Pre-Engineering Technology and Other Programs

Pre-Engineering Technology at OCVTS is a STEM-based program of study designed to prepare high school juniors and seniors to apply engineering principles to the digital fabrication process. Areas of study include Computer-Aided Drafting (CAD), and 3D CAD Solid Modeling technologies to design, 3D-Printing Prototyping, Computer-Aided Manufacturing (CAM), Computer Numerical Controlled Machining (CNC) with G-Code Programming, Computer-Integrated Manufacturing (CIM) using Robotics, and Programmable Logic Controllers (PLC).

Additional OCVTS programs which incorporate the fundamentals of manufacturing concepts include:

- Welding, which teaches techniques in shielded metal arc, gas metal arc, gas tungsten arc, and flux cored arc welding as well as oxy-fuel gas and plasma arc cutting with the possible attainment of the American Welding Society (AWS) Certification
- Creative Woodworking and Design program where students learn the fundamentals of woodworking through the use of traditional equipment and hand tools, plus the latest computer numerically controlled (CNC) machinery and software designed to manufacture parts to specification, assemble, and finish work.
- Machine Trades, a four-year apprenticeship program that includes safety, machine operations/layout, precision measurement, shop procedures, and blue print reading/drawing.

Contact: Gary MacDonald, OCVTS Supervisor, gmacdonald@mail.ocvts.org, 732-240-6414

Passaic County Technical Institute - Manufacturing Technology and Other Programs

Passaic County Technical Institute's Manufacturing Technology Program introduces young minds to the in-demand metal fabrication industry. The comprehensive course work is designed to prepare students for entry-level employment opportunities in the manufacturing/machining industry, or to continue on to post-secondary training.

Students work in a state-of-the-art manufacturing training facility that mirrors current industry standards. The working classroom is equipped with a high-tech computer lab offering training in MasterCam, and has an

impressive production floor equipped with manual lathes, mills, drill presses, surface grinders, and saws. The CNC lab is equipped with state of the art HAAS lathes and mills.

Students are encouraged to explore various career opportunities through job-shadowing opportunities offered through the school's School to Careers Department with the valuable assistance of strong industry partnerships. The program has consistently placed more than 50% of the senior class in successful cooperative education experiences.

An articulation agreement with Bergen Community College allows students to earn 6 credits in Applied Metrology and Machine Tool Principles. Upon completion of the program, students are able to enter the workforce, continue on to post-secondary training or combine both pathways.

PCTI also offers manufacturing-related programs in welding and pre-engineering.
Contact: Mark Cacace, School to Careers Coordinator, mcacace@pcti.tec.nj.us, 973-389-4152

Somerset County Vocational & Technical High School – Mechatronics, Engineering and Advanced Manufacturing (MEAM)

SCVTHS launched a new program for highly-motivated high school students interested in Mechatronics, Engineering and Advanced Manufacturing (MEAM) in September, 2016.

The program is offered through a partnership with Raritan Valley Community College (RVCC), as well as local businesses. It is designed to teach students how to apply mathematical and scientific principles to the design, development and operational evaluation of the physical systems used in manufacturing, and end-product systems designed for specific uses.

As part of the partnership, RVCC offers a minimum of 13 college credits for students who successfully complete the program. Upon graduation from the MEAM program, students will be ready to enter the workforce or pursue further education in highly coveted Science, Technology, Engineering and Math (STEM) careers.
Contact: Dr. Chrys Harttraft, Superintendent, charttraft@scvts.net, 908-526-8900.