**Skilled Technical Sciences Secondary Program Descriptions**

**Aligned with**

**National Occupations from O\*NET**

**2023**

**Skilled Technical Sciences Secondary Program Descriptions**

**Aligned with National Occupations from O\*NET**

**General Courses**

 **Multiple Clusters**

Foundations of Technical Careers**.** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 6

 Connections to Technical Careers . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 6

 Trade and Industrial Supervised Employment . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 6

**Arts, A/V Technology and Communications Cluster**

 **Journalism and Broadcasting/Pathway**

Radio & TV Broad 10.0202 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 7

 **Printing Pathway**

Commercial Art 50.0402 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 7

Commercial Photo 50.0406 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 7

Graphic Arts 10.0305 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 8

3D Modeling and Animation 50.0102 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 8

**Manufacturing Cluster**

 **Production Pathway**

Machinist 48.0501 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 9

Sheet Metal 48.0506 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 9

Welding Technology 48.0508 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 10

Tool and Die 48.05011 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 10

Metal Fabrication 48.0511 . . . . . .. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 10

Iron Work/Iron Worker 48.0509 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 10-11

**Manufacturing Production Process Development Pathway**

Electrical and Electronics Eq Repair 47.0101 . . . . . . . . . . . . . . . . . . . . . . . . . .11

Industrial Design 15.0612 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 11

Manufacturing Technology/Technical 15.0613 . . . . . . . . . . . . . . . . . . . . . . . . 11

Laser and Optical Technology/Tech 15.0304 . . . . . . . . . . . . . . . . . . . . . . . . . . 12

**Manufacturing Cluster Continued**

**Maintenance, Installation, and Repair Pathway**

Industrial Equipment Maintenance Repair 47.0303 . . . . . . . . . . . . . . . . . . . . . 12

Industrial Electronics 47.0105 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 12

Industrial/Manufacturing Technology/Tech 15.0613 . . . . . . . . . . . . . . . . . . . 12-13

Robotics Technology 15.0405 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 13

Electromechanical Technology 15.0403 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 13

Electrical, Electronic and Communications Engineering Technology 15.0303 . 13

Biomedical Engineering 15.0401 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 14

**Health, Safety, and Environmental Assurance**

 Quality Waste Water Management and Recycling Technology . . . . . . . 14

 Alternative Energy 15.1701 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 14

**Architecture and Construction Cluster**

 **Design and Pre-Construction Pathway**

Drafting and Design Technology 15.0301 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 15

Cartography 45.0702 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 15

Civil Engineering 15.0201 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 16

Architectural Design and Construction Technology 15.0101 . . . . . . . . . . . . . 16

**Maintenance/Operations Pathway**

Air Conditioning, Heating and Refrigeration 47.0201 . . . . . . . . . . . . . . . . . . . . 16

Custodial Services 46.0401 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 17

Building Maintenance 46.0401 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 17

**Construction Pathway**

Painter and Wallcoverer 46.0408 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 17

Construction Technology 46.0000 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 18

Carpentry 46.0201 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 18

Electrician 46.0302 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 18

Masonry 46.0101 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 18

Plumbing 46.0503 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 19

Pipefitting 46.0502 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 19

Floor Layers 46.04013 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 19

Cabinet Making and Millwork 48.0703 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 19

Electrical and Power Transmission Installation/Installer 46.0301 . . . . . . . . . . . 20

**Transportation, Distribution and Logistics Cluster**

**Facility and Mobile Eq. Maintenance Pathway**

 Auto Body /Collision and Repair 47.0603 . . . . . . . . . . . . . . . . . . . . . . . . . . . . 21

 Auto Mechanics 47.0604 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 21

 Motorcycle Mechanics and Repair 47.0611 . . . . . . . . . . . . . . . . . . . . . . . . . . . 22

 Aircraft Mechanics Air Frame 47.0607 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 22

 Aircraft Mechanics Powerframe 47.0608 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 22

 Aviation Management 49.0104 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 22-23

 Heavy Equipment Maintenance and Repair 47.0302 . . . . . . . . . . . . . . . . . . . . 23

 Diesel Mechanics 47.0605 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 23

 Marine Maintenance 47.0606 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 23

 Small Engine Repair 47.0606 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 23

**Law, Public Safety, Corrections and Securing Cluster**

 **Emergency and Fire Management Services Pathway**

 Fire Control and Safety Technology 43.0201 . . . . . . . . . . . . . . . . . . . . . . . . . . 24

 Fire Science and Fire Fighting 43.0203 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 24

 **Security and Protective Services Pathway**

 Criminal Justice Technology 43.0107 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 25

 Law Enforcement Training 43.0107. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .25

**Information Technology Cluster**

 **Network Systems Pathway**

 Computer Servicing Technology 15.1202 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 26

 Computer Installer and Repair 10.0105 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 26

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**Skilled Technical Sciences Secondary Program Descriptions**

**Aligned with**

**National Occupations from O\*NET**

**National Career Cluster – Arts, A/V Technology and Communications Cluster**

**General Courses**

**Foundations of Technical Careers DESE CIP Code NA, Course Code 170904**

**Connections to Technical Careers DESE CIP Code NA, Course Code 170903**

Aligned too Architecture & Construction, Manufacturing, and Transportation and Logistics Clusters.

## **Course Rational**

The exploratory 9th grade course titled, *Foundations of Technical Careers*, and the introductory 10th grade course titled, *Connections to Technical Careers,* allows students to build knowledge for entry into the more advanced programs. Both courses are designed as 50-minute, 175-day courses based on the core foundational knowledge and skills needed in the following three careers: Manufacturing, Transportation and Logistics, and Architecture and Construction.

**Trade and Industrial Supervised Employment –All Clusters**

This class allows for the release of students who are on track for graduation to go to work in an occupation that matches their program of study.

**Journalism and Broadcasting/Pathway**

**Radio and Television Broadcast DESE CIP Code 10.0202 - O\*NET Code 27-3011.00**

Speak or read from scripted materials, such as news reports or commercial messages, on radio or television. May announce artist or title of performance, identify station, or interview guests.

**Sample of reported job titles:** Anchor, Announcer, DJ (Disc Jockey), Host, Meteorologist, Morning Show Host, News Anchor, Radio Announcer, Sports Director, Television News Anchor (TV News Anchor)

**Printing Pathway**

**Commercial Art DESE CIP Code 50.0402 - O\*NET Code 27-1024.00**

Design or create graphics to meet specific commercial or promotional needs, such as packaging, displays, or logos. May use a variety of mediums to achieve artistic or decorative effects.

**Sample of reported job titles:** Artist, Creative Director, Creative Manager, Design Director, Designer, Graphic Artist, Graphic Designer, Online Producer, Production Artist, Publications Designer

**Commercial Photo DESE CIP Code 50.0406 - O\*NET Code 27-4021.00**

Photograph people, landscapes, merchandise, or other subjects, using digital or film cameras and equipment. May develop negatives or use computer software to produce finished images and prints. Includes scientific photographers, aerial photographers, and photojournalists.

**Sample of reported job titles:** Advertising Photographer, Commercial Photographer, Newspaper Photographer, Owner/Photographer, Photo Editor, Photographer, Photojournalist, Portrait Photographer, Sports Photographer, Studio Owner

**Graphic Arts DESE CIP Code 10.0305 - O\*NET Code 27-1024.00**

Design or create graphics to meet specific commercial or promotional needs, such as packaging, displays, or logos. May use a variety of mediums to achieve artistic or decorative effects.

**Sample of reported job titles:** Artist, Creative Director, Creative Manager, Design Director, Designer, Graphic Artist, Graphic Designer, Online Producer, Production Artist, Publications Designer

**3D Modeling and Animation DESE CIP Code 50.0102 – O\*NET Code 50.0102 Digital Arts**

Design or create graphics to meet specific commercial or promotional needs, such as packaging, displays, or logos. May use a variety of mediums to achieve artistic or decorative effects.

**Sample of reported job titles:** Artist, Designer, Graphic Artist, Graphic Designer, Online Producer, Production Artist, Publications Designer

**Skilled Technical Sciences Secondary Program Descriptions**

**Aligned with**

**National Occupations from O\*NET**

**National Career Cluster – Manufacturing**

**Production Pathway**

**Machinists DESE CIP Code 48.0501 - O\*NET Code 51-4041.00**

Set up and operate a variety of machine tools to produce precision parts and instruments. Includes precision instrument makers who fabricate, modify, or repair mechanical instruments. May also fabricate and modify parts to make or repair machine tools or maintain industrial machines, applying knowledge of mechanics, mathematics, metal properties, layout, and machining procedures.

**Sample of reported job titles:** Gear Machinist, Journeyman Machinist, Machine Operator, Machine Repair Person, Machinist, Maintenance Machinist, Maintenance Specialist, Production Machinist, Set-Up Machinist, Tool Room Machinist

# Sheet Metal Workers DESE CIP Code 48.0506 – O\*NET Code 47-2211.00

Fabricate, assemble, install, and repair sheet metal products and equipment, such as ducts, control boxes, drainpipes, and furnace casings. Work may involve any of the following: setting up and operating fabricating machines to cut, bend, and straighten sheet metal; shaping metal over anvils, blocks, or forms using hammer; operating soldering and welding equipment to join sheet metal parts; or inspecting, assembling, and smoothing seams and joints of burred surfaces. Includes sheet metal duct installers who install prefabricated sheet metal ducts used for heating, air conditioning, or other purposes.

**Sample of reported job titles:** Field Installer; HVAC Sheet Metal Installer (Heating, Ventilation, and Air Conditioning Sheet Metal Installer); Journeyman Sheet Metal Worker; Sheet Metal Apprentice; Sheet Metal Fabricator; Sheet Metal Foreman; Sheet Metal Installer; Sheet Metal Layout Mechanic; Sheet Metal Mechanic; Sheet Metal Worker

**Welding Technology DESE CIP Code** **48.0508 – O\*NET Code 51-4121.00**

Use hand-welding, flame-cutting, hand soldering, or brazing equipment to weld or join metal components or to fill holes, indentations, or seams of fabricated metal products.

**Sample of reported job titles:** Aluminum Welder, Fabrication Welder, Fabricator, Fitter/Welder, Maintenance Welder, MIG Welder (Metal Inert Gas Welder), Sub Arc Operator, Welder, Welder-Fitter, Welder/Fabricator

**Tool and Die DESE CIP Code 48.0507- O\*NET Code 51-4111.00**

Analyze specifications, lay out metal stock, set up and operate machine tools, and fit and assemble parts to make and repair dies, cutting tools, jigs, fixtures, gauges, and machinists' hand tools.

**Sample of reported job titles:** Aircraft Tool Maker, Carbide Tool Die Maker, Die Maker, Jig and Fixture Builder, Jig and Fixture Repairer, Tool and Die Machinist, Tool and Die Maker, Tool Repairer, Toolmaker, Trim Die Maker

**Metal Fabrication DESE CIP Code 48.0511 - O\*NET Code 47-2211.00**

Fabricate, assemble, install, and repair sheet metal products and equipment, such as ducts, control boxes, drainpipes, and furnace casings. Work may involve any of the following: setting up and operating fabricating machines to cut, bend, and straighten sheet metal; shaping metal over anvils, blocks, or forms using hammer; operating soldering and welding equipment to join sheet metal parts; or inspecting, assembling, and smoothing seams and joints of burred surfaces. Includes sheet metal duct installers who install prefabricated sheet metal ducts used for heating, air conditioning, or other purposes.

**Sample of reported job titles:** Field Installer; HVAC Sheet Metal Installer (Heating, Ventilation, and Air Conditioning Sheet Metal Installer); Journeyman Sheet Metal Worker; Sheet Metal Apprentice; Sheet Metal Fabricator; Sheet Metal Foreman; Sheet Metal Installer; Sheet Metal Layout Mechanic; Sheet Metal Mechanic; Sheet Metal Worker

**Iron work/Iron Worker DESE CIP Code 48.0509 - O\*NET Code 47-2221.00**

Raise, place, and unite iron or steel girders, columns, and other structural members to form completed structures or structural frameworks. May erect metal storage tanks and assemble prefabricated metal buildings.

**Iron work/Iron Worker DESE CIP Code 48.0509 - O\*NET Code 47-2221.00 Continued**

**Sample of reported job titles:** Fitter, Fitter / Welder, Iron Worker, Iron Worker Foreman, Ironworker, Rigger, Steel Fabricator, Steel Worker, Structural Steel Erector, Tower Hand

**Manufacturing Production Process Development Pathway**

**Electrical and Electronics Eq Repair DESE CIP Code 47.0101 - O\*NET Code 47-2111.00**

Install, maintain, and repair electrical wiring, equipment, and fixtures. Ensure that work is in accordance with relevant codes. May install or service street lights, intercom systems, or electrical control systems.

**Sample of reported job titles:** Chief Electrician; Control Electrician; Electrician; Industrial Electrician; Inside Wireman; Journeyman Electrician; Journeyman Wireman; Maintenance Electrician; Mechanical Trades Specialist, Electrician; Qualified Craft Worker, Electrician (QCW, Electrician)

**Industrial Design DESE CIP Code 15.0612 - O\*NET Code 17-2112.00**

Design, develop, test, and evaluate integrated systems for managing industrial production processes, including human work factors, quality control, inventory control, logistics and material flow, cost analysis, and production coordination.

**Sample of reported job titles:** Engineer, Engineering Manager, Industrial Engineer, Manufacturing Specialist, Operations Engineer, Plant Engineer, Process Engineer, Production Engineer, Supply Chain Engineer, Tool Engineer

**Manufacturing Technology/Technical DESE CIP Code 15.0613 - O\*NET Code 17-3029.06**

Develop tools, implement designs, or integrate machinery, equipment, or computer technologies to ensure effective manufacturing processes.

**Sample of reported job titles:** Business Process Analyst, Manufacturing Coordinator, Manufacturing Technology Analyst, Product Manager, Scientist

**Laser and Optical Technology/Tech DESE CIP Code 15.0304- O\*NET Code 17-3029.08**

Build, install, test, or maintain optical or fiber optic equipment, such as lasers, lenses, or mirrors, using spectrometers, interferometers, or related equipment.

**Sample of reported job titles:** Coating Manager, Engineering Technician (Engineering Tech), Engineering Technologist, Fiber Optics Technician, Laser Technician, Lead Technician, Optomechanical Technician, Photonic Laboratory Technician (Photonic Lab Tech), Photonics Technician, Ruling Technician

**Maintenance, Installation, and Repair Pathway**

**Industrial Equipment Maintenance Repair DESE CIP Code 47.0303 - O\*NET Code 49-9041.00**

Repair, install, adjust, or maintain industrial production and processing machinery or refinery and pipeline distribution systems.

**Sample of reported job titles:** Fixer, Industrial Machinery Mechanic, Industrial Mechanic, Loom Fixer, Machine Adjuster, Maintenance Mechanic, Maintenance Technician, Master Mechanic, Mechanic, Over hauler

**Industrial Electronics DESE CIP Code 47.0105 – O\*NET Code 49-2094.00**

Repair, test, adjust, or install electronic equipment, such as industrial controls, transmitters, and antennas.

**Sample of reported job titles:** Control Technician, E and I Mechanic (Electrical and Instrument Mechanic), E and I Mechanic (Electrical and Instrumentation Mechanic), Electrical and Instrument Technician (E and I Tech), Electrical Maintenance Technician, Electronic Technician, I and C Tech (Instrument and Control Technician), Instrument and Electrical Technician (I and E Tech), Repair Technician, Scale Technician

**Industrial /Manufacturing Technology/Technician DESE CIP Code 15.0613**

**- O\*NET Code 17-3026.00**

Apply engineering theory and principles to problems of industrial layout or manufacturing production, usually under the direction of engineering staff. May perform time and motion studies on worker operations in a variety of industries for purposes such as establishing standard production rates or improving efficiency.

**Sample of reported job titles:** Engineering Technician, Industrial Engineering Analyst, Industrial Engineering Technician, Manufacturing Technician, Methods Engineer, Process Documentation and Methods Analyst, Process Engineer, Process Technician, Production Staff Worker, Quality Control Engineering Technician (QC Engineering Technician)

**Robotics Technology DESE CIP Code 15.0405 – O\*NET Code 17-3024-01**

Build, install, test, or maintain robotic equipment or related automated production systems.

**Sample of reported job titles:** Automation Technician, Electrical and Instrumentation Technician (E and I Technician), Instrument and Automation Technician, Instrument Specialist, Instrument Technician, Instrumentation and Controls Technician, Instrumentation and Process Controls Technician, Process Control Technician, Programmable Logic Controllers Technician

**Electromechanical Technology** **DESE CIP Code 15.0403** **- O\*NET Code 51-2023.00 Continued**

Operate, test, maintain, or calibrate unmanned, automated, servo-mechanical, or electromechanical equipment. May operate unmanned submarines, aircraft, or other equipment at worksites, such as oil rigs, deep ocean exploration, or hazardous waste removal. May assist engineers in testing and designing robotics equipment.

**Sample of reported job titles:** Electro-Mechanic, Electro-Mechanical Technician (E/M Technician), Electronic Technician, Engineering Technician, Laboratory Technician (Lab Technician), Maintenance Technician, Mechanical Technician, Product Test Specialist, Test Technician, Tester

**Electrical, Electronic and Communications Engineering Technology DESE CIP Code 15.0303 – O\*NET Code 17-3023.00**

Apply electrical and electronic theory and related knowledge, usually under the direction of engineering staff, to design, build, repair, adjust, and modify electrical components, circuitry, controls, and machinery for subsequent evaluation and use by engineering staff in making engineering design decisions.

**Sample of reported job titles:** Communications Technologist, Electrical Engineering Technician, Electrical Technician, Electronics Engineering Technician, Electronics Technician, Engineering Technician (Engineering Tech), Engineering Technologist, System Technologist, Technologist

**Biomedical Engineering – Related Technology CIP Code 15.0401 – O\*NET Code 49-9062.00**

Test, adjust, or repair biomedical or electromedical equipment.

**Sample of reported job titles:** Biomed Tech (Biomedical Technician), Biomedical Electronics Technician, Biomedical Engineering Technician (BMET), Biomedical Equipment Technician (BMET), Dental Equipment Technician, Electronic Technician, Repair Technician, Service Technician, X-ray Service Engineer

**Health, Safety, and Environmental Assurance**

# Water Quality Waste and Wastewater Treatment Management and Recycling Technology DESE CIP Code 15.0506 - O\*NET Code 51-8031.00

Operate or control an entire process or system of machines, often through the use of control boards, to transfer or treat water or wastewater.

**Sample of reported job titles:** Plant Operator, Process Operator (Process Op), Relief Operator, SCADA Operator (Supervisory Control and Data Acquisition Operator), Waste Water Treatment Plant Operator (WWTP Operator), Wastewater Operator (WW Operator), Water Control Dispatcher, Water Plant Operator, Water Treatment Operator, Water Treatment Plant Operator

**Alternative Energy DESE CIP Code 15.1701- O\*NET Code 17-3029.00**

Engineering and Technologists and Technicians, Except Drafters, all others.

The Engineering Technician assists engineering personnel in the technical development, evaluation and testing of new product development of electronic motor controls. This technician sets up and performs electrical, environmental and agency testing to support engineering and design qualification of electronic motor controls. In addition, also supports activities to maintain a safe and efficient operating environment in the electronic lab.

**Skilled Technical Sciences Secondary Program Descriptions**

**Aligned with**

**National Occupations from O\*NET**

**National Career Cluster – Architecture and Construction Cluster**

**Design and Pre-Construction Pathway**

**Drafting and Design Technology DESE CIP Code 15.0301 - O\*NET Code 17-3013.00**

Prepare detailed working diagrams of machinery and mechanical devices, including dimensions, fastening methods, and other engineering information.

**Sample of reported job titles:** CAD Designer (Computer Aided Design Designer), CAD Operator (Computer Aided Design Operator), Design Drafter, Designer, Drafter, Drafting Technician, Mechanical Designer, Mechanical Drafter, Product Designer, Project Designer

**Cartography DESE CIP Code 45.0702- O\*NET Code 17-1021.00**

Collect, analyze, and interpret geographic information provided by geodetic surveys, aerial photographs, and satellite data. Research, study, and prepare maps and other spatial data in digital or graphic form for legal, social, political, educational, and design purposes. May work with Geographic Information Systems (GIS). May design and evaluate algorithms, data structures, and user interfaces for GIS and mapping systems.

**Sample of reported job titles:** Aerial Photogrammetrist, Cartographer, Cartographic Designer, Compiler, Digital Cartographer, Mapper, Photogrammetric Technician, Photogrammetrist, Stereo Compiler, Stereo plotter Operator

**Civil Engineering DESE CIP Code 15.0201- O\*NET Code 17-2051.00**

Perform engineering duties in planning, designing, and overseeing construction and maintenance of building structures, and facilities, such as roads, railroads, airports, bridges, harbors, channels, dams, irrigation projects, pipelines, power plants, and water and sewage systems.

**Sample of reported job titles:** Bridge/Structure Inspection Team Leader, City Engineer, Civil Engineer, Civil Engineering Manager, County Engineer, Design Engineer, Project Engineer, Railroad Design Consultant, Structural Engineer, Traffic Engineer

**Architectural Design and Construction Technology DESE CIP Code 15.0101 – O\*NET Code 17-3011.00**

Prepare detailed drawings of architectural and structural features of buildings or drawings and topographical relief maps used in civil engineering projects, such as highways, bridges, and public works. Use knowledge of building materials, engineering practices, and mathematics to complete drawings.

**Sample of reported job titles:** Architectural Designer, Architectural Drafter, Architectural Draftsman, Civil Drafter, Computer-Aided Design Designer (CAD Designer), Computer-Aided Drafting and Design Drafter (CADD Drafter), Computer-Aided Drafting Designer (CAD Designer), Drafting Technician, Draftsman, Draftsperson

**Maintenance/Operations Pathway**

**Air Conditioning, Heating and Refrigeration DESE CIP Code 47.0201 - O\*NET Code 49-9021.00**

Install or repair heating, central air conditioning, or refrigeration systems, including oil burners, hot-air furnaces, and heating stoves.

**Sample of reported job titles:** A/C Tech (Air Conditioning Technician); HVAC Installer (Heating, Ventilation, Air Conditioning Installer); HVAC Mechanic (Heating, Ventilation, Air Conditioning Mechanic); HVAC Service Tech (Heating, Ventilation, Air Conditioning Service Technician); HVAC Service Technician (Heating, Ventilation, Air Conditioning Service Technician); HVAC Specialist (Heating, Ventilation, and Air Conditioning Specialist); HVAC Technician (Heating, Ventilation, Air Conditioning Technician); HVAC Technician (Heating, Ventilation, and Air Conditioning Technician); Service Technician; Systems Mechanic

**Custodial Services DESE CIP Code 46.0401- O\*NET Code 37-1011.00**

Directly supervise and coordinate work activities of cleaning personnel in hotels, hospitals, offices, and other establishments.

**Sample of reported job titles:** Buildings and Grounds Supervisor, Custodian, Environmental Services Director, Environmental Services Supervisor (EVS), Executive Housekeeper, Facilities Manager, Head Custodian, Housekeeping Director, Housekeeping Supervisor, Maintenance Supervisor

**Building Maintenance DESE CIP Code 46.0401- O\*NET Code 49-9071.00**

Perform work involving the skills of two or more maintenance or craft occupations to keep machines, mechanical equipment, or the structure of an establishment in repair. Duties may involve pipe fitting; boiler making; insulating; welding; machining; carpentry; repairing electrical or mechanical equipment; installing, aligning, and balancing new equipment; and repairing buildings, floors, or stairs.

**Sample of reported job titles:** Building Maintenance Mechanic, Building Mechanic, Equipment Engineering Technician, Facilities Manager, Maintenance Engineer, Maintenance Man, Maintenance Mechanic, Maintenance Supervisor, Maintenance Technician, Maintenance Worker

**Construction Pathway**

**Painter and Wallcoverer DESE CIP Code 46.0408- O\*NET Code 47-2142.00**

Cover interior walls or ceilings of rooms with decorative wallpaper or fabric, or attach advertising posters on surfaces such as walls and billboards. May remove old materials or prepare surfaces to be papered.

Sample of reported job titles: Bill Board Poster, Bill Poster, Hanger, Paper Hanger, Paperhanger, Vinyl Hanger, Wall Covering Contractor, Wall Covering Installer, Wallpaper Hanger, Wallpaper Installer

**Construction Technology DESE CIP Code 46.0000 - O\*NET Code 47-1011.00**

Directly supervise and coordinate activities of construction or extraction workers.

**Sample of reported job titles:** Construction Foreman, Construction Superintendent, Construction Supervisor, Field Supervisor, Foreman, Job Superintendent, Project Superintendent, Site Superintendent, Superintendent, Supervisor

**Carpentry DESE CIP Code 46.0201- O\*NET Code 47-2031.01**

Construct, erect, install, and repair structures and fixtures of wood, plywood, and wallboard, using carpenter's hand tools and power tools.

**Carpentry DESE CIP Code 46.0201- O\*NET Code 47-2031.01 Continued**

**Sample of reported job titles:** Assembler, Cabinet Maker, Carpenter Foreman, Carpentry Foreman, Concrete Carpenter, Construction Superintendent, Construction Worker, Foreman, Framer, Production Worker

**Electrician DESE CIP Code 46.0302 - O\*NET Code 47-2111.00**

Install, maintain, and repair electrical wiring, equipment, and fixtures. Ensure that work is in accordance with relevant codes. May install or service street lights, intercom systems, or electrical control systems.

**Sample of reported job titles:** Chief Electrician; Control Electrician; Electrician; Industrial Electrician; Inside Wireman; Journeyman Electrician; Journeyman Wireman; Maintenance Electrician; Mechanical Trades Specialist, Electrician; Qualified Craft Worker, Electrician (QCW, Electrician)

**Masonry DESE CIP Code 46.0101- O\*NET Code 47-2021.00**

Lay and bind building materials, such as brick, structural tile, concrete block, cinder block, glass block, and terra-cotta block, with mortar and other substances to construct or repair walls, partitions, arches, sewers, and other structures.

**Sample of reported job titles:** Block Layer, Block Mason, Block mason, Brick and Block Mason, Brick Mason, Bricklayer, Concrete Finisher, Mason, Masonry Installer, Tender

**Plumbing DESE CIP Code 46.0503- O\*NET Code 47-2152.02**

Assemble, install, or repair pipes, fittings, or fixtures of heating, water, or drainage systems, according to specifications or plumbing codes.

**Sample of reported job titles:** Commercial Plumber; Drain Cleaner, Plumber; Drain Technician; Journeyman Plumber; Master Plumber; Plumber; Plumber Gasfitter; Plumbing and Heating Mechanic; Residential Plumber; Service Plumber

**Pipefitting DESE CIP Code 46.0502- O\*NET Code 47-2152.01**

Lay out, assemble, install, or maintain pipe systems, pipe supports, or related hydraulic or pneumatic equipment for steam, hot water, heating, cooling, lubricating, sprinkling, or industrial production or processing systems.

**Sample of reported job titles:** Equipment Service Associate (ESA), Fire Sprinkler Service Technician, Journeyman Pipe Fitter, Journeyman Pipefitter, Machine Repairman, Pipe Fitter, Pipe Welder, Pipefitter, Sprinkler Fitter, Steamfitter

**Floor Layers DESE CIP Code 46.0413- O\*NET Code 47-2042.00**

Apply blocks, strips, or sheets of shock-absorbing, sound-deadening, or decorative coverings to floors.

**Sample of reported job titles:** Floor Covering Contractor, Floor Coverings Installer, Floor Layer, Flooring Helper, Flooring Installer, Flooring Mechanic, Tile Installer, Tile Setter, Vinyl Installer

**Cabinet Making and Millwork DESE CIP Code 48.0703 – O\*NET Code 51-7011.00**

Cut, shape, and assemble wooden articles or set up and operate a variety of woodworking machines, such as power saws, jointers, and mortisers to surface, cut, or shape lumber or to fabricate parts for wood products.

**Sample of reported job titles:** Cabinet Assembler, Cabinet Builder, Cabinet Installer, Cabinetmaker, Double End Tenon Operator, Frame Builder, Framer, Woodworker

**Electrical and Power Transmission Installation/Installer DESE CIP Code 46.0301- O\*NET Code 49-9051.00**

Install or repair cables or wires used in electrical power or distribution systems. May erect poles and light or heavy duty transmission towers.

**Sample of reported job titles:** A Class Lineman, Apprentice Lineman Third Step, Class A Lineman, Electric Lineman, Electrical Lineman (Power), Electrical Line worker, Journeyman Lineman, Lineman, Line worker, Power Lineman

**Skilled Technical Sciences Secondary Program Descriptions**

**Aligned with**

**National Occupations from O\*NET**

**National Career Cluster – Transportation, Distribution and Logistics Cluster**

**Facility and Mobile Eq Maintenance Pathway**

**Autobody/Collision and Repair DESE CIP Code 47.0603 - O\*NET Code 49-3021.00**

Repair and refinish automotive vehicle bodies and straighten vehicle frames.

**Sample of reported job titles:** Auto Body Man, Auto Body Repair Technician (Auto Body Repair Tech), Auto Body Repairman, Auto Body Technician (Auto Body Tech), Body Man, Body Technician (Body Tech), Collision Repair Technician (Collision Repair Tech), Collision Technician (Collision Tech), Frame Man, Refinish Technician (Refinish Tech)

**Auto Mechanics DESE CIP Code 47.0604 - O\*NET Code 49-3023.00**

Diagnose, adjust, repair, or overhaul automotive vehicles.

**Sample of reported job titles:** A/C Technician (Air Conditioning Technician), Automobile Mechanic (Auto Mechanic), Automobile Technician (Auto Technician), Automotive Technician (Auto Technician), Drivability Technician, Heavy Line Technician, Lube Technician, Oil Bay Technician, Quick Service Technician, Service Technician, ASE Master Mechanic (Automotive Service Excellence Master Mechanic), Auto Technician (Automotive Technician), Automotive Drivability Technician, Automotive Mechanic (Auto Mechanic), Automotive Service Technician, Certified ASE Master Automotive Technician (Certified Automotive Service Excellence Master Automotive Technician), Master Automotive Technician, Master Technician, Mechanic, Transmission Rebuilder

**Motorcycle Mechanics and Repair DESE CIP Code 47.0611 - O\*NET Code 49-3052.00**

Diagnose, adjust, repair, or overhaul motorcycles, scooters, mopeds, dirt bikes, or similar motorized vehicles.

**Sample of reported job titles:** All-Terrain Vehicle Technician (ATV Technician), Custom Bike Builder, Master Motorcycle Technician, Motorcycle Mechanic, Motorcycle Service Technician, Motorcycle Technician, Motorsports Technician, Scooter Mechanic, Service Technician, Shop Foreman

**Aircraft Mechanics /Air Frame DESE CIP 47.0607 - O\*NET Code 51-2011.00**

Assemble, fit, fasten, and install parts of airplanes, space vehicles, or missiles, such as tails, wings, fuselage, bulkheads, stabilizers, landing gear, rigging and control equipment, or heating and ventilating systems.

**Sample of reported job titles:** A&P Technician (Airframe and Powerplant Technician), Aircraft Line Assembler, Assembler, Assembly Riveter, Fabricator, Helicopter Technician, Sheet Metal Assembler and Riveter (SMAR), Sheet Metal Mechanic, Structures Mechanic, Structures Technician

**Aircraft Mechanics/ Powerframe DESE CIP Code 47.0608 - O\*NET Code 49-3011.00**

Diagnose, adjust, repair, or overhaul aircraft engines and assemblies, such as hydraulic and pneumatic systems. Includes helicopter and aircraft engine specialists.

**Sample of reported job titles:** Aircraft Maintenance Director, Aircraft Maintenance Supervisor, Aircraft Maintenance Technician (Aircraft Maintenance Tech), Aircraft Mechanic, Aircraft Restorer, Aircraft Technician, Airframe and Power plant Mechanic (A and P Mechanic), Aviation Maintenance Technician (AMT), Aviation Mechanic, Helicopter Mechanic

**Aviation Management DESE CIP Code 49.0104 - O\*NET Code 53-2012.00**

Pilot and navigate the flight of fixed-winged aircraft on nonscheduled air carrier routes, or helicopters. Requires Commercial Pilot certificate. Includes charter pilots with similar certification, and air ambulance and air tour pilots.

**Sample of reported job titles:** Captain, Charter Pilot, Check Airman, Chief Pilot, Commercial Pilot, EMS Helicopter Pilot (Emergency Medical Service Helicopter Pilot), First Officer, Helicopter Pilot, Line Pilot, Pilot

**Heavy Equipment Maintenance and Repair DESE CIP Code 47.0302- O\*NET Code 49-9043.00**

Lubricate machinery, change parts, or perform other routine machinery maintenance.

**Sample of reported job titles:** Lubricator, Machine Repairer, Maintainer, Maintenance Man, Maintenance Technician, Maintenance Worker, Oiler, Over hauler

**Diesel Mechanics DESE CIP Code 47.0605- O\*NET Code 49-3031.00**

Diagnose, adjust, repair, or overhaul buses and trucks, or maintain and repair any type of diesel engines. Includes mechanics working primarily with automobile or marine diesel engines.

**Sample of reported job titles:** Bus Mechanic, Diesel Mechanic, Diesel Technician, Fleet Mechanic, General Repair Mechanic, Mechanic, Service Technician, Trailer Mechanic, Transit Mechanic, Truck Mechanic

**Marine Maintenance DESE CIP Code 47.0606- O\*NET Code 49-3051.00**

Repair and adjust electrical and mechanical equipment of inboard or inboard-outboard boat engines.

**Sample of reported job titles:** Boat Mechanic, Boat Motor Mechanic, Boat Rigger, Marine Mechanic, Marine Propulsion Technician, Marine Technician, Mechanic, Outboard Motor Mechanic, Outboard Technician, Service Technician

**Small Engine Repair DESE CIP Code 47.0606- O\*NET Code 49-3053.00**

Diagnose, adjust, repair, or overhaul small engines used to power lawn mowers, chain saws, recreational sporting equipment and related equipment.

**Sample of reported job titles:** Chainsaw Technician, Golf Cart Mechanic, Lawnmower Repair Mechanic, Mechanic, Outdoor Power Equipment Service Technician, Service Technician (Service Tech), Shop Mechanic, Small Engine Mechanic, Small Engine Technician

**Skilled Technical Sciences Secondary Program Descriptions**

**Aligned with**

**National Occupations from O\*NET**

**National Career Cluster – Law, Public Safety, Corrections and Security Cluster**

**Emergency and Fire Management Services Pathway**

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**Fire Control and Safety Technology DESE CIP Code 43.0201 - O\*NET Code 33-2011.00**

Control and extinguish fires or respond to emergency situations where life, property, or the environment is at risk. Duties may include fire prevention, emergency medical service, hazardous material response, search and rescue, and disaster assistance.

**Sample of reported job titles:** Apparatus Operator, Fire Captain, Fire Chief, Fire Engineer, Fire Equipment Operator, Fire Fighter, Firefighter, Fireman, Safety Officer, Volunteer Firefighter,  Fire Management Specialist, Fire Rescue Technician, Fire Technician, Firefighter, Forest Fire Suppression Specialist, Forestry Fire Technician, Hot Shot, On-Scene Supporter, Wildland Firefighter

**Fire Science and Fire Fighting DESE CIP Code 43.0203 - O\*NET Code 33-2011.00**

Control and extinguish fires or respond to emergency situations where life, property, or the environment is at risk. Duties may include fire prevention, emergency medical service, hazardous material response, search and rescue, and disaster assistance.

**Sample of reported job titles:** Apparatus Operator, Fire Captain, Fire Chief, Fire Engineer, Fire Equipment Operator, Fire Fighter, Firefighter, Fireman, Safety Officer, Volunteer Firefighter,  Fire Management Specialist, Fire Rescue Technician, Fire Technician, Firefighter, Forest Fire Suppression Specialist, Forestry Fire Technician, Hot Shot, On-Scene Supporter, Wildland Firefighter

**Security and Protective Services Pathway**

**Criminal Justice Technology DESE CIP Code 43.0107 - O\*NET Code 33-3051.00**

Maintain order and protect life and property by enforcing local, tribal, State, or Federal laws and ordinances. Perform a combination of the following duties: patrol a specific area; direct traffic; issue traffic summonses; investigate accidents; apprehend and arrest suspects, or serve legal processes of courts.

**Sample of reported job titles:** Alcohol Law Enforcement Agent (ALE Agent), Law Enforcement Officer, Officer, Patrol Officer, Peace Officer, Police Officer, Police Patrol Officer, Public Safety Officer, State Trooper, Uniform Patrol Police Officer, Canine Deputy (K-9 Deputy), Chief Deputy Sheriff, Civil Division Deputy Sheriff, Civil Process Server, Corporal-Road Deputy with Sheriff Department, Deputy, Deputy (Patrol), Deputy Sheriff, Deputy Sheriff (Generalist)-Bailiff, Drug Abuse Resistance Education Officer (DARE Officer)

**Law Enforcement Training DESE CIP Code 43.0107 – O\*NET Code**

 Maintain order and protect life and property by enforcing local, tribal, State, or Federal laws and ordinances. Perform a combination of the following duties: patrol a specific area; direct traffic; issue traffic summonses; investigate accidents; apprehend and arrest suspects, or serve legal processes of courts.

**Sample of reported job titles:** Alcohol Law Enforcement Agent (ALE Agent), Law Enforcement Officer, Officer, Patrol Officer, Peace Officer, Police Officer, Police Patrol Officer, Public Safety Officer, State Trooper, Uniform Patrol Police Officer, Canine Deputy (K-9 Deputy), Chief Deputy Sheriff, Civil Division Deputy Sheriff, Civil Process Server, Corporal-Road Deputy with Sheriff Department, Deputy, Deputy (Patrol), Deputy Sheriff, Deputy Sheriff (Generalist)-Bailiff, Drug Abuse Resistance Education Officer (DARE Officer)

**Skilled Technical Sciences Secondary Program Descriptions**

**Aligned with**

**National Occupations from O\*NET**

**National Career Cluster – Information Technology Cluster**

**Network Systems Pathway**

**Computer Servicing Technology DESE CIP Code 15.1202- O\*NET Code** 15-1151.00

Provide technical assistance to computer users. Answer questions or resolve computer problems for clients in person, or via telephone or electronically. May provide assistance concerning the use of computer hardware and software, including printing, installation, word processing, electronic mail, and operating systems.

**Sample of reported job titles:** Computer Specialist, Computer Support Specialist, Computer Technician, Desktop Support Technician, Help Desk Analyst, Help Desk Technician, Information Technology Specialist (IT Specialist), Network Technician, Support Specialist, Technical Support Specialist

**Computer Installer and Repair DESE CIP Code 47.0104 - O\*NET Code 15-1152.00**

Analyze, test, troubleshoot, and evaluate existing network systems, such as local area network (LAN), wide area network (WAN), and Internet systems or a segment of a network system. Perform network maintenance to ensure networks operate correctly with minimal interruption.

**Sample of reported job titles:** Computer Network Specialist, IT Consultant (Information Technology Consultant), Network Engineer, Network Specialist, Network Support Specialist, Network Technical Analyst, Network Technician, Personal Computer Network Analyst, Senior IT Assistant (Senior Information Technology Assistant), Systems Specialist

**Skilled Technical Sciences Secondary Program Descriptions**

**Aligned with**

**National Occupations from O\*NET**

**Reference Page**

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| **Skilled Technical Sciences**  |
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| **Programs that Could be all Virtual**  |  |
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| 170701 | 50.0102 | 3D Modeling and Animation |  |  |  |
| 170622 | 49.0104 | Aviation Management |  |  |  |
| 171301 | 45.0702 | Cartography |  |  |  |
| 170700 | 50.0402 | Commercial Art Occupations |  |  |  |
| 170900 | 50.0406 | Commercial Photography Occupations |  |  |  |
| 170102 | 10.0105 | Communications Electronics |  |  |  |
| 173101 | 15.1202 | Computer Servicing Technology |  |  |  |
| 171300 | 15.1301 | Drafting and Design Technology |  |  |  |
| 171900 | 10.0305 | Graphic Arts Occupations |  |  |  |
| 70623 | 15.0612 | Industrial Design |  |  |  |
| 170108 | 10.0202 | Radio and Television Broadcasting Technology/Technician |  |  |  |
| 170902 | 15.0506 | Water Quality and Wastewater Treatment Management and Recycling Technology/Technician |  |  |  |