



**BETHLEHEM AREA VOCATIONAL-TECHNICAL
SCHOOL
3300 CHESTER AVENUE BETHLEHEM PA 18020**

BUILDING TRADES

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BUILDING TRADES

Course Description:

The Building Trades program involves several different construction disciplines including, but not limited to carpentry, plumbing, electrical, and masonry. The first year students will be in a hands-on learning environment by working on their skills on a full scale house project in the shop. The students are instructed in all construction fields and will be trained in demonstrating proper work ethic for the build trades industry.

The second and third year students will be learning construction management skills by leading the student projects, working in the construction industry through are co-op program and working on off-site projects in the community. At the end of the program, student's mastery of skills will be tested through NOCTI.

Students who wish to continue in this field should continue their education at a two or four trade school, apprenticeship program with a local employer or gain experience in the military.

Students can pursue a career in either residential or commercial construction.

Average pay: According to salary.com, the average salary in Bethlehem, PA

- Construction Management - \$104,091
- Construction and Building Inspector - \$55,140
- Carpenter - \$55,104
- Drywall Installer - \$47,468
- Building Trades Apprentice - \$36,050
- Roofer - \$35,548
- Carpenters helper - \$32,180
- Construction Laborer - \$31,800

College/Trade Schools:

Pennsylvania College of Technology

CONSTRUCTION & DESIGN TECHNOLOGIES

Bachelor of Science (B.S.)

- [Architecture and Sustainable Design](#)
- [Civil Engineering Technology](#)
- [Construction Management](#)
- [Heating, Ventilation & Air Conditioning Design Technology](#)
- [Residential Construction Technology and Management](#)
- [Residential Construction Technology and Management: Architecture Concentration](#)
- [Residential Construction Technology and Management: Building Construction Technology Concentration](#)

Associate of Applied Science (A.A.S.)

- [Architecture](#)
- [Building Construction Technology](#)
- [Civil Engineering Technology](#)
- [Concrete Science Technology](#)
- [Heating, Ventilation & Air Conditioning Technology](#)
- [Surveying Technology](#)

Certificate

- [Plumbing](#)

In demand careers: Drywall & Ceiling Tile Installers, Helpers—Carpenters, Helpers—Electricians, Helpers--Pipelayers, Plumbers, Pipefitters & Steamfitters, Painters, Construction & Maintenance, Brickmasons & Blockmasons, Carpenters, Electricians and Plumbers

Reference Material:

Residential Construction Academy Carpentry
Career Safe OSHA 10

Classroom Tools:

Hand Tools

- Measuring and layout tools
- Squares
- Screwdrivers and wrenches
- Chisels
- Hand saws
- Levels
- Hammers
- Prying tools
- Clamps

Portable Power Tools

- Drills
- Saws
- Sanders
- Routers

Stationary Power Tools

- Jointer
- Thickness planer
- Table saw
- Band saw
- Shaper
- Drill press
- Disc/belt sander

Building Trades Scope and Sequence

Grade 10 (Hours)	Grade 11 (Hours)	Grade 12 (Hours)
Shop Safety (65)	Shop Safety (48)	Shop Safety (48)
Hand & Power Tools (67)	Hand & Power Tools (60)	Hand & Power Tools (50)
Blueprint and Site Reading (50)	Blueprint and Site Reading (48)	Blueprint and Site Reading (58)
Footings & Foundations (47)	Footings & Foundations (50)	Footings & Foundations (50)
Framing (85)	Framing (83)	Framing (88)
Interior & Exterior Finish (80)	Interior & Exterior Finish (68)	Interior & Exterior Finish (68)
Estimation (66)	Estimation (65)	Estimation (68)
Related Building Trades (65)	Related Building Trades (88)	Related Building Trades (80)

Course Syllabus Level 1

Syllabus: 46.0201 Building Trades

Level 1 – First Quarter (10-Day Rotation)

Competencies Covered

10 SAFETY/OCCUPATIONAL ORIENTATION

- 10 Follow basic lab and construction industry safety practices and procedures.
- 40 Follow procedures in Safety Data Sheets (SDS) system.

20 HAND TOOLS

- 10 Use and maintain small hand tools.
- 20 Use and maintain sawing tools.
- 30 Use and maintain fastening tools.
- 40 Use and maintain measuring tools.
- 50 Use and maintain cutting tools.

30 POWER TOOLS

- 30 Use and maintain portable electric power tools.

Assignments & Assessments

- Basic Shop Safety 1
- Basic Shop Safety 2
- Hand Tool Safety 4
- Safe use of Chisel 5
- Measuring Project
- Hand Tool Project
- Wall Project

Level 1 – Second Quarter (45 Days)

Competencies Covered

10 SAFETY/OCCUPATIONAL ORIENTATION

- 10 Follow basic lab and construction industry safety practices and procedures.
- 40 Follow procedures in Safety Data Sheets (SDS) system.

20 HAND TOOLS

- 10 Use and maintain small hand tools.
- 20 Use and maintain sawing tools.
- 30 Use and maintain fastening tools.
- 40 Use and maintain measuring tools.
- 50 Use and maintain cutting tools.
- 70 Use and maintain ladders.

30 POWER TOOLS

- 10 Use and maintain stationary electric power tools.
- 20 Use and maintain pneumatic tools systems.
- 30 Use and maintain portable electric power tools.

40 BLUEPRINT READING

- 10 Interpret blueprints.
- 20 Interpret and comprehend standard symbols and abbreviations.
- 30 Interpret building specifications.

Assignments & Assessments

Hand tool safety

Portable power tool safety

Stationary power tool safety

Sawhorse project

Blueprint reading

Level 1 – Third Quarter (45 Days)

Competencies Covered

40 BLUEPRINT READING

- 40 Interpret a plot plan.
- 50 Read and interpret a foundation plan.
- 60 Read and interpret elevation plans.
- 70 Interpret details and section views.
- 80 Interpret floor, wall and roof framing plans.
- 90 Interpret building and zoning codes.
- 100 Interpret Americans with Disabilities Act (ADA) regulations.

50 SITE PREPARATION AND LAYOUT

- 10 Determine factors needed to be considered before the start of a building project.
- 20 Acquire a building permit.
- 30 Use PA One Call System Inc.
- 40 Establish elevations and grades from benchmarks using leveling instruments.
- 50 Stake out a building foundation using the Pythagorean theorem.
- 60 Layout and construct batter boards.

60 FOOTINGS AND FOUNDATIONS

- 10 Determine footer type.
- 20 Use of leveling instruments.
- 30 Establish footer lines and elevations.
- 50 Layout and construct forms for footers.
- 60 Layout foundations.

70 FRAMING – FLOOR CONSTRUCTION

- 10 Determine methods used to fasten sill plates.
- 20 Properly install fasteners used in floor framing.
- 30 Properly measure and install sill plates.
- 40 Properly measure and install floor joists including manufactured floor joists.
- 50 Properly measure and install joists for a cantilever floor.
- 60 Properly layout and construct cross and solid bridging.
- 70 Properly layout and install sub-flooring.
- 80 Properly measure and frame floor openings.

80 FRAMING – WALL CONSTRUCTION

- 20 Layout and construct a wall.
- 40 Layout and construct door openings.
- 50 Layout and construct window openings.
- 60 Layout and construct solid headers.
- 70 Layout and install sheathing.
- 80 Plumb, align and brace walls.

Assignments & Assessments

Masonry Tool Identification

Construct block foundation according to blueprint

List all parts of floor framing

Construct floor frame according to blueprint

List all parts of wall framing

Construct wall frame according to blueprint

Install doors and windows in rough openings

Install vinyl siding

Plan a wiring layout

Install a duplex outlet

Install a single pole switch with light

Level 1 – Fourth Quarter (45 Days)

Competencies covered

100 EXTERIOR FINISH

- 30 Install house wrap.
- 40 Install exterior doors.
- 50 Install windows.
- 60 Layout and install siding.

110 INTERIOR FINISH

- 30 Layout, install and finish drywall.
- 50 Layout and install interior doors.
- 60 Layout and install a door trim, casings and hardware.
- 70 Layout and install window trim, casings and hardware.
- 80 Layout and install baseboard and molding.
- 90 Layout and install flooring materials.

Assignments & Assessments

Apply sheet stock with drywall screws and screw gun

Perform drywall finishing procedure

Identify different types of paints, stains and other finishes

Identify different types of brushes, roller covers and other applicators used in painting

Apply paint using a brush and paint roller

Install doors and windows in rough openings

Install vinyl siding

Plan a wiring layout

Install a duplex outlet

Install a single pole switch with light

Level 1 - Outcome

Students will be able to safely use hand and power tools to complete construction projects according to the blueprint provided through guided instruction provided by instructor.

Level 2

First Quarter (45-Day)

Competencies Covered

10 SAFETY/OCCUPATIONAL ORIENTATION

- 10 Follow basic lab and construction industry safety practices and procedures.
- 40 Follow procedures in Safety Data Sheets (SDS) system.
- 50 Identify and follow all OSHA safety standards at the construction site.

20 HAND TOOLS

- 10 Use and maintain small hand tools.
- 20 Use and maintain sawing tools.
- 30 Use and maintain fastening tools.
- 40 Use and maintain measuring tools.
- 50 Use and maintain cutting tools.

30 POWER TOOLS

- 10 Use and maintain stationary electric power tools.
- 20 Use and maintain pneumatic tools systems.
- 30 Use and maintain portable electric power tools.

40 BLUEPRINT READING

- 10 Interpret blueprints.
- 20 Interpret and comprehend standard symbols and abbreviations.
- 90 Interpret building and zoning codes.

50 SITE PREPARATION AND LAYOUT

- 10 Determine factors needed to be considered before the start of a building project.
- 20 Acquire a building permit.
- 30 Use PA One Call System Inc.
- 40 Establish elevations and grades from benchmarks using leveling instruments.
- 50 Stake out a building foundation using the Pythagorean theorem.
- 60 Layout and construct batter boards.

60 FOOTINGS AND FOUNDATIONS

- 10 Determine footer type.

- 20 Use of leveling instruments.
- 30 Establish footer lines and elevations.
- 50 Layout and construct forms for footers.
- 60 Layout foundations.

120 ESTIMATION

- 10 Estimate the cost and amount bricks and blocks needed to complete a given task.
- 20 Estimate the cost and amount of concrete needed to complete a given task.

Assignments & Assessments

Basic Shop Safety 3

Portable Power Tool Safety 6

Stationary Power Tool Safety 7

Jointer Safety 9

Thickness Planer Safety 10

Table Saw Safety 11

Dado Blade Safety 12

Band Saw Safety 13

Tool Tray

Blueprint reading

Pythagorean Theorem

Block foundation

NOCTI review

Level 2 – Second Quarter (45 Days)

Competencies Covered

10 SAFETY/OCCUPATIONAL ORIENTATION

50 Identify and follow all OSHA safety standards at the construction site.

20 HAND TOOLS

10 Use and maintain small hand tools.

20 Use and maintain sawing tools.

30 Use and maintain fastening tools.

40 Use and maintain measuring tools.

50 Use and maintain cutting tools.

70 Use and maintain ladders.

80 Use and maintain finishing tools.

100 Construct scaffolding.

30 POWER TOOLS

10 Use and maintain stationary electric power tools.

20 Use and maintain pneumatic tools systems.

30 Use and maintain portable electric power tools.

40 BLUEPRINT READING

10 Interpret blueprints.

20 Interpret and comprehend standard symbols and abbreviations.

30 Interpret building specifications.

40 Interpret a plot plan.

50 Read and interpret a foundation plan.

60 Read and interpret elevation plans.

70 Interpret details and section views.

80 Interpret floor, wall and roof framing plans.

90 Interpret building and zoning codes.

100 Interpret Americans with Disabilities Act (ADA) regulations.

70 FRAMING – FLOOR CONSTRUCTION

10 Determine methods used to fasten sill plates.

20 Properly install fasteners used in floor framing.

30 Properly measure and install sill plates.

- 40 Properly measure and install floor joists including manufactured floor joists.
- 50 Properly measure and install joists for a cantilever floor.
- 60 Properly layout and construct cross and solid bridging.
- 70 Properly layout and install sub-flooring.
- 80 Properly measure and frame floor openings.

80 FRAMING – WALL CONSTRUCTION

- 20 Layout and construct a wall.
- 40 Layout and construct door openings.
- 50 Layout and construct window openings.
- 60 Layout and construct solid headers.
- 70 Layout and install sheathing.
- 80 Plumb, align and brace walls.
- 90 Layout and install metal studs.

120 ESTIMATION

- 20 Estimate the cost and amount of concrete needed to complete a given task.
- 30 Estimate the cost and amount of materials to finish an exterior wall.

Assignments & Assessments

- Blueprint reading
- List all parts of floor framing
- Construct floor frame according to blueprint
- List all parts of wall framing
- Construct wall frame according to blueprint
- Estimating
- NOCTI review

Level 2 – Third Quarter (45 Days)

Competencies Covered

40 BLUEPRINT READING

- 60 Read and interpret elevation plans.
- 70 Interpret details and section views.
- 80 Interpret floor, wall and roof framing plans.
- 90 Interpret building and zoning codes.
- 100 Interpret Americans with Disabilities Act (ADA) regulations.

90 FRAMING – ROOF CONSTRUCTION

- 30 Layout and install a ridgeboard.
- 40 Layout and install common rafters.
- 50 Layout and install hip and jack rafters.
- 60 Layout and install roof trusses.
- 70 Layout and install roof sheathing.
- 80 Layout and construct roof openings.
- 90 Layout and install roofing paper.
- 100 Layout and install roofing materials.
- 110 Layout and install capping.

100 EXTERIOR FINISH

- 30 Install house wrap.
- 40 Install exterior doors.
- 50 Install windows.
- 60 Layout and install siding.
- 70 Layout and install soffits and fascias.
- 80 Layout and install gutters and downspouts.
- 90 Layout and install exterior stair systems.

120 ESTIMATION

- 60 Estimate the cost and amount of materials to construct a finished roof.
- 70 Estimate the cost and amount of materials to install siding for a house.

Assignments & Assessments

Layout common rafter
Construct roof frame according to blueprint
Exterior siding
Plan a wiring layout
Install a duplex outlet
Install a single pole switch with light
Estimating
NOCTI review

Level 2 – Fourth Quarter (45 Days)

Competencies covered

100 EXTERIOR FINISH

30 Install house wrap.
40 Install exterior doors.
50 Install windows.
60 Layout and install siding.

110 INTERIOR FINISH

30 Layout, install and finish drywall.
50 Layout and install interior doors.
60 Layout and install a door trim, casings and hardware.
70 Layout and install window trim, casings and hardware.
80 Layout and install baseboard and molding.
90 Layout and install flooring materials.

Assignments & Assessments

Apply sheet stock with drywall screws and screw gun
Perform drywall finishing procedure
Identify different types of paints, stains and other finishes
Identify different types of brushes, roller covers and other applicators used in painting

Apply paint using a brush and paint roller

Install doors and windows in rough openings

Install vinyl siding

NOCTI performance certification

Final exam/project

Level 2 - Outcome

Students will be able to safely use hand and power tools to complete construction projects according to the blueprint provided through guided instruction provided by a level-3 student.

Level 3

First Quarter (45-Day)

Competencies Covered

10 SAFETY/OCCUPATIONAL ORIENTATION

- 10 Follow basic lab and construction industry safety practices and procedures.
- 40 Follow procedures in Safety Data Sheets (SDS) system.
- 50 Identify and follow all OSHA safety standards at the construction site.

20 HAND TOOLS

- 10 Use and maintain small hand tools.
- 20 Use and maintain sawing tools.
- 30 Use and maintain fastening tools.
- 40 Use and maintain measuring tools.
- 50 Use and maintain cutting tools.

30 POWER TOOLS

- 10 Use and maintain stationary electric power tools.
- 20 Use and maintain pneumatic tools systems.
- 30 Use and maintain portable electric power tools.

40 BLUEPRINT READING

- 10 Interpret blueprints.
- 20 Interpret and comprehend standard symbols and abbreviations.
- 90 Interpret building and zoning codes.

50 SITE PREPARATION AND LAYOUT

- 10 Determine factors needed to be considered before the start of a building project.
- 20 Acquire a building permit.
- 30 Use PA One Call System Inc.
- 40 Establish elevations and grades from benchmarks using leveling instruments.
- 50 Stake out a building foundation using the Pythagorean theorem.
- 60 Layout and construct batter boards.

60 FOOTINGS AND FOUNDATIONS

- 10 Determine footer type.

- 20 Use of leveling instruments.
- 30 Establish footer lines and elevations.
- 50 Layout and construct forms for footers.
- 60 Layout foundations.

120 ESTIMATION

- 10 Estimate the cost and amount bricks and blocks needed to complete a given task.
- 20 Estimate the cost and amount of concrete needed to complete a given task.

Assignments & Assessments

- Basic Shop Safety 3
- Portable Power Tool Safety 6
- Stationary Power Tool Safety 7
- Jointer Safety 9
- Thickness Planer Safety 10
- Table Saw Safety 11
- Dado Blade Safety 12
- Band Saw Safety 13
- Tool Tray
- Blueprint reading
- Pythagorean Theorem
- Block foundation
- NOCTI review

Level 3 – Second Quarter (45 Days)

Competencies Covered

10 SAFETY/OCCUPATIONAL ORIENTATION

50 Identify and follow all OSHA safety standards at the construction site.

20 HAND TOOLS

10 Use and maintain small hand tools.

20 Use and maintain sawing tools.

30 Use and maintain fastening tools.

40 Use and maintain measuring tools.

50 Use and maintain cutting tools.

70 Use and maintain ladders.

80 Use and maintain finishing tools.

100 Construct scaffolding.

30 POWER TOOLS

10 Use and maintain stationary electric power tools.

20 Use and maintain pneumatic tools systems.

30 Use and maintain portable electric power tools.

40 BLUEPRINT READING

10 Interpret blueprints.

20 Interpret and comprehend standard symbols and abbreviations.

30 Interpret building specifications.

40 Interpret a plot plan.

50 Read and interpret a foundation plan.

60 Read and interpret elevation plans.

70 Interpret details and section views.

80 Interpret floor, wall and roof framing plans.

90 Interpret building and zoning codes.

100 Interpret Americans with Disabilities Act (ADA) regulations.

70 FRAMING – FLOOR CONSTRUCTION

10 Determine methods used to fasten sill plates.

20 Properly install fasteners used in floor framing.

- 30 Properly measure and install sill plates.
- 40 Properly measure and install floor joists including manufactured floor joists.
- 50 Properly measure and install joists for a cantilever floor.
- 60 Properly layout and construct cross and solid bridging.
- 70 Properly layout and install sub-flooring.
- 80 Properly measure and frame floor openings.

80 FRAMING – WALL CONSTRUCTION

- 20 Layout and construct a wall.
- 40 Layout and construct door openings.
- 50 Layout and construct window openings.
- 60 Layout and construct solid headers.
- 70 Layout and install sheathing.
- 80 Plumb, align and brace walls.
- 90 Layout and install metal studs.

120 ESTIMATION

- 20 Estimate the cost and amount of concrete needed to complete a given task.
- 30 Estimate the cost and amount of materials to finish an exterior wall.

Assignments & Assessments

Blueprint reading

List all parts of floor framing

Construct floor frame according to blueprint

List all parts of wall framing

Construct wall frame according to blueprint

Estimating

NOCTI review

Level 3 – Third Quarter (45 Days)

Competencies Covered

40 BLUEPRINT READING

- 60 Read and interpret elevation plans.
- 70 Interpret details and section views.
- 80 Interpret floor, wall and roof framing plans.
- 90 Interpret building and zoning codes.
- 100 Interpret Americans with Disabilities Act (ADA) regulations.

90 FRAMING – ROOF CONSTRUCTION

- 30 Layout and install a ridgeboard.
- 40 Layout and install common rafters.
- 50 Layout and install hip and jack rafters.
- 60 Layout and install roof trusses.
- 70 Layout and install roof sheathing.
- 80 Layout and construct roof openings.
- 90 Layout and install roofing paper.
- 100 Layout and install roofing materials.
- 110 Layout and install capping.

100 EXTERIOR FINISH

- 30 Install house wrap.
- 40 Install exterior doors.
- 50 Install windows.
- 60 Layout and install siding.
- 70 Layout and install soffits and fascias.
- 80 Layout and install gutters and downspouts.
- 90 Layout and install exterior stair systems.

120 ESTIMATION

- 60 Estimate the cost and amount of materials to construct a finished roof.
- 70 Estimate the cost and amount of materials to install siding for a house.

Assignments & Assessments

Layout common rafter
Construct roof frame according to blueprint
Exterior siding
Plan a wiring layout
Install a duplex outlet
Install a single pole switch with light
Estimating
NOCTI review

Level 3 – Fourth Quarter (45 Days)

Competencies covered

100 EXTERIOR FINISH

30 Install house wrap.
40 Install exterior doors.
50 Install windows.
60 Layout and install siding.

110 INTERIOR FINISH

30 Layout, install and finish drywall.
50 Layout and install interior doors.
60 Layout and install a door trim, casings and hardware.
70 Layout and install window trim, casings and hardware.
80 Layout and install baseboard and molding.
90 Layout and install flooring materials.

Assignments & Assessments

Apply sheet stock with drywall screws and screw gun
Perform drywall finishing procedure
Identify different types of paints, stains and other finishes
Identify different types of brushes, roller covers and other applicators used in painting

Apply paint using a brush and paint roller

Install doors and windows in rough openings

Install vinyl siding

NOCTI performance certification

Final exam/project

Level 3 Outcome

Students will be able to be a project manager to guide level II students to safely use hand and power tools to complete construction projects according to the blueprint provided.

Level-3 students will be eligible to obtain a co-op job in the construction industry.

Bethlehem Area Vocational-Technical School

Curriculum Packet

46.0201 Building Trades

Supplemental Learning Activities*

Students who participate in this program will also have opportunities to participate in the following program and school-sponsored activities:

SkillsUSA: Professional Development Conference, Local Competitions, State Competitions, National Competitions. Students will also be able to participate in yearly events held at BAVTS: Chapter Meetings, fundraising and carnival.

NTHS: Level II and Level III students who have received an “A” in their career and technical program as well as a “B” average at their sending school are eligible to become a member of the BAVTS Chapter of the National Technical Honor Society.

Cooperative Education: Students who have attended six quarters in their career and technical program are eligible to participate in a paid working experience during the PM session of BAVTS. Positions must be available and the student must be recommended by the CTE teacher to be eligible.

Job Shadowing: Students are eligible to visit business and industry partners for one or more days to view the day-to-day operations of this career area.

Internships: Students who have completed six or more quarters of their CTE program are eligible to work for a business and industry partner with the recommendation of the instructor and the availability of assignment.

Field Trips: Students in this program will on occasion attend field trips that expose them to educational experiences within the career field.

***College Credit:** Building Trades students are eligible for advanced credit through a Statewide Articulation Agreement developed by the Pennsylvania Department of Education.

Students are recommended to attend post-secondary training upon graduation from BAVTS to ensure success within the career field.