Architecture and Construction

The Architecture and Construction career cluster focuses on designing, planning, managing, building, and maintaining the built environment. This career cluster includes occupations ranging from architect, carpenter, and construction manager to electrician, plumber and heating, air conditioning, and refrigeration technician.

Program of Study: Plumbing & Pipefitting (Dual Credit)

The Plumbing and Pipefitting program of study focuses on occupational and educational opportunities related to assembling, installing, and repairing pipes, fittings, or fixtures of heating, water, and drainage systems. The program of study includes maintaining pipe supports and related hydraulic or pneumatic equipment for steam, hot water, heating, cooling, lubricating, and sprinkling.

Courses

	Plumbing/Pipefitting	Alternative Option
9th Grade	Introduction to Welding	Introduction to Welding
10th Grade	Welding I	Welding I
11th Grade	Pipefitting Technology I @ San Jacinto College Pipefitting Technology II @ San Jacinto College Practicum in Construction Technology @ San Jacinto College	Welding II @ San Jacinto College
12th Grade	Plumbing Technology I @ San Jacinto College Plumbing Technology II @ San Jacinto College Extended Practicum in Construction Technology @ San Jacinto College	Students may elect to complete only Plumbing **OR** only Pipefitting in this alternative option.

Work-Based Learning/Expanded Learning Opportunities

Work-Based Learning Activities	• Earn industry certification • Intern or shadow a plumber or pipefitter
Expanded Learning Opportunities	• SkillsUSA • Earn dual credit hours

Aligned Industry-Based Certifications

- NCCER Core

Example Postsecondary Opportunities

Apprenticeships

- Plumber
- Pipefitter

Associate Degrees

- Pipefitting/Pipefitter and Sprinkler Fitter
- Construction Site Management
- Plumbing Technology
- Property Maintenance

Bachelor's Degrees

- Construction Engineering
- Construction Management

Master's, Doctoral, and Professional Degrees

- Construction Engineering
- Construction Management

Additional Stackable IBCs/License

- Journeyman Plumber
- Master Plumber

Example Aligned Occupations

Helpers—Pipelayers, Plumbers, Pipefitters, and Steamfitters
Median Wage: $36,352
Annual Openings: 1,482
10-Year Growth: 26%

Plumbers, Pipefitters, and Steamfitters
Median Wage: $55,804
Annual Openings: 5,751
10-Year Growth: 22%

Construction Managers
Median Wage: $95,072
Annual Openings: 6,325
10-Year Growth: 24%

Successful completed of this program of study will fulfill requirements of the Business and Industry Endorsement.
Approved Statewide Program of Study. C. E. King High School – 2024-25

Level 1

Introduction to Welding 13032250

Grade: 9 **Credit: 1**

Introduction to Welding will provide an introduction to welding technology with an emphasis on basic welding laboratory principles and operating procedures. Students will be introduced to the three basic welding processes. Topics include: industrial safety and health practices, hand tool and power machine use, measurement, laboratory operating procedures, welding power sources, welding career potentials, and introduction to welding codes and standards. Introduction to Welding will provide students with the knowledge, skills, and technologies required for employment in welding industries. Students will develop knowledge and skills related to welding and apply them to personal career development. This course supports integration of academic and technical knowledge and skills. Students will reinforce, apply, and transfer knowledge and skills to a variety of settings and problems. Knowledge about career opportunities, requirements, and expectations and the development of workplace skills will prepare students for future success.

Level 2

Welding I 13032300

Grade: 10 **Credit: 2**
Recommended Prerequisite: Introduction to Welding

Welding I provides the knowledge, skills, and technologies required for employment in metal technology systems. Students will develop knowledge and skills related to this system and apply them to personal career development. This course supports integration of academic and technical knowledge and skills. Students will reinforce, apply, and transfer knowledge and skills to a variety of settings and problems. Knowledge about career opportunities, requirements, and expectations and the development of workplace skills prepare students for future success.

Pipefitting Technology I @ San Jacinto College N1300425

Grade: 11-12 **Credit: 1**
Prerequisite: Welding II

Students will learn the types of work performed, responsibilities and career opportunities within the industry, and safety principles associated with pipefitting.

Plumbing Technology I @ San Jacinto College 13006000

Grade: 12 **Credit: 1**
Prerequisite: Welding II

In Plumbing Technology I, students will gain knowledge and skills needed to enter the industry as a plumbing apprentice, building maintenance technician, or supervisor or prepare for a postsecondary degree in construction management, architecture, or engineering. Students will acquire knowledge and skills in industry workplace basics and employer/customer expectations, including how to use a plumbing code book; how to identify and use power and hand tools; how to be safe on the jobsite and when using hand and power tools; how to apply basic plumbing mathematics and plumbing drawing; and how to identify, fit, and use plastic, copper, cast iron, carbon steel, and corrugated stainless steel pipe. In addition, students will be introduced to gas, drainage, and water supply systems and continue their knowledge of workplace basics and green technologies.

Level 3

Welding II @ San Jacinto College — 13032400

Grade: 11-12 **Credit: 2**
Prerequisite: Welding I

Welding II builds on the knowledge and skills developed in Welding I. Students will develop advanced welding concepts and skills as related to personal and career development. Students will integrate academic and technical knowledge and skills. Students will have opportunities to reinforce, apply, and transfer knowledge and skills to a variety of settings and problems.

Pipefitting Technology II @ San Jacinto College — N1300426

Grade: 11-12 **Credit: 1**
Prerequisite: Pipefitting Technology I

Students will learn about, identify, and install various types of piping systems and valves. Students will be able to read detail and drawing sheets and use mathematics to solve problems related to pipefitting construction.

Plumbing Technology II @ San Jacinto College — N1300426

Grade: 12 **Credit: 2**
Prerequisite: Pipefitting Technology I

In Plumbing Technology II, students will gain the advanced knowledge and skills needed to enter the industry as a plumber, building maintenance technician, or supervisor or prepare for a postsecondary degree in mechanical engineering. Students will acquire knowledge and skills in plumbing codes, industry workplace basics, and employer/customer expectations, including tool and jobsite safety, advanced plumbing mathematics, commercial drawings, basic electricity, hanger installation, supports and structural penetrations, roof drains, fixture installation, valves and faucets, and oxy-fuel safety. Students will also learn about setup, cutting, brazing and welding water system sizing; gas, drain, waste and vent installation and testing; and water heater installation.

Level 4

Practicum in Construction Technology @ San Jacinto College — 13005250

Grade: 11-12 **Credit: 2**
Prerequisite: Pipefitting Technology II

In Practicum in Construction Technology, students will be challenged with the application of knowledge and skills gained in previous construction-related coursework. In many cases students will be involved in projects the school has approved for this class.

Extended Practicum in Construction Technology @ San Jacinto College — 13005255

Grade: 12 **Credit: 2**
Prerequisite: Plumbing Technology II

In Practicum in Construction Technology, students will be challenged with the application of knowledge and skills gained in previous construction-related coursework. In many cases students will be involved in projects the school has approved for this class. Safety and career opportunities are included in addition to work ethics and job-related study in the classroom.