



The following programs of study are available within the Manufacturing cluster.

- Health, Safety and Environmental Assurance
- Logistics and Inventory Control
- Maintenance, Installation and Repair
- Manufacturing Production Process Development
- Production
- Quality Assurance

9658CT

Formerly Introduction to Precision Metals Manufacturing

Principles of Manufacturing

- ⇒ **Grade Placement 9-12**
- ⇒ **Credit 1/2 Unit**
- ⇒ **Prerequisite None**

In this course, students gain knowledge and skills in the application, design, production and assessment of products, services and systems. Student will explore the various fields in metalworking and will receive experience in the use of precision and non-precision tools as they learn the basic operations of manufacturing. Students will be involved in the problem solving process, safety with hand tools and power tools, familiarization of different welding and machining techniques. Special attention will be given to the various careers available in the machine shop and welding industries. Klein Forest HS will emphasize the machining processes and Klein Oak HS will emphasize the welding process.

9662CT

Formerly Machine Shop I

Precision Metal Manufacturing

- ⇒ **Grade Placement 10-12**
- ⇒ **Credit 2 Units**
- ⇒ **Prerequisite Approval Process**

Precision Metal Manufacturing is a two-year program which prepares students to enter the workforce in the machine trades industry. Students will learn manual machining operations on the lathe, mill, and drill press. Instruction will include practices in work habits, career goals, blueprint reading, mathematics, measurement, and safety. Machine practices learned will include CNC, cutting, and heat treating. This course is only offered at Klein Forest High School.

9666CT

Formerly Machine Shop II

Advanced Precision Metal Manufacturing

- ⇒ **Grade Placement 11-12**
- ⇒ **Credit 2 Units**
- ⇒ **Prerequisite Precision Metal Manufacturing and Approval Process**
- ⇒ **Past Prereq Machine Shop I and Approval Process**

This course will provide students with advanced knowledge of computer numerical controlled (CNC) machining. In addition to learning Mastercam programming and operation, the students will learn Level 2 of milling and operating the lathe. Students will learn to write programs without the use of CAD, design projects and develop machine setup techniques. This course is offered at Klein Forest High School.

Welding

- ⇒ **Grade Placement 10-12**
- ⇒ **Credit 2 Units**
- ⇒ **Prerequisite Approval Process**

This two-year program prepares students to be skilled workers and to understand, perform and supervise or inspect a wide variety of welding processes. These processes include gas welding, brazing, flame cutting, plasma cutting, shielded metal arc welding and resistance welding. Introduction to gas metal arc welding, gas tungsten arc welding and flux core welding will also be explored. Students will develop a basic understanding of design for welding fabrication, an understanding of the cost and economics of various types welding. Students are introduced to the methods of nondestructive and destructive inspection of welds and welded products. Students will also develop math and problem solving skills used in the welding field. The nationally accredited CONTREN learning series, approved by the National Center for Construction Education and Research and the Associated Builders and Contractors, greater Houston chapter is a supplemental curriculum resource for this course. This class meets for two periods each school day at Klein Oak High School. AWS certification is available upon passing of Structural Steel D1.1 codebook. Students will be responsible for purchasing materials or assessed a fee associated with this course.

Advanced Welding

- ⇒ **Grade Placement 11-12**
- ⇒ **Credit 2 Units**
- ⇒ **Prerequisite Welding and Approval Process**
- ⇒ **Past Prereq Welding I and Approval Process**

The advanced welding program prepares students to be skilled workers and to understand, perform and supervise or inspect a wide variety of welding processes. These include gas welding, flame cutting, plasma cutting, arc gouging, shielded metal arc welding, gas metal arc welding, gas tungsten arc welding and flux core welding. Students will develop a basic understanding of design for welding fabrication, an understanding of the cost and economics of welding of various types. Also introduced are the methods of nondestructive and destructive inspection of welds and welded products and an understanding of auxiliary equipment used in the process, such as jigs, fixtures, and tools and equipment related to welding. Students will develop math skills and problem solving skills used in the welding field. The nationally accredited CONTREN learning series, approved by the National Center For Construction Education & Research and the Associated Builders & Contractors, greater Houston chapter, is the co curriculum for instruction in the course. Classes meet for two periods each school day at Klein Oak High School. AWS certification is available upon passing of Structural Steel D1.1 codebook. Students will be responsible for purchasing materials or assessed a fee associated with this course. **Advanced Technical Credit and Tech Prep college credit are available through community colleges in Texas.**

CTED Welding, Career and Technology Education for Students with Disabilities

- ⇒ **Grade Placement 9-12**
- ⇒ **Credit 2 Units**
- ⇒ **Prerequisite Recommendation of ARD Committee**

This program prepares special needs students to be skilled workers and to understand, perform and supervise or inspect a wide variety of welding processes. These processes include gas welding, brazing, flame cutting, plasma cutting, shielded metal arc welding and resistance welding. Introduction to gas metal arc welding, gas tungsten arc welding and flux core welding will also be explored. Students will develop a basic understanding of design for welding fabrication, an understanding of the cost and economics of various types welding. Students will be responsible for purchasing materials or assessed a fee associated with this course. This course will be offered at Klein High School.

Problems and Solutions in Trade & Industrial Education

- ⇒ *Grade Placement 12*
- ⇒ *Credit 1/2-1 Unit*
- ⇒ *Prerequisite Completion of at least Two Courses in the Chosen Career Concentration Coherent Sequence and Approval Process*

A project-based learning experience developed by a student or group of students, teacher and an interdisciplinary mentor team. The project provides opportunities for an in-depth study of at least one aspect of an industry in the trade and industrial program area. The student or group demonstrates the ability to utilize a variety of resources, advanced technology, and communication skills in the development and presentation of a project. **This project-based course may allow a student to meet one of the Distinguished Achievement Program advanced measures. Incoming 9th graders of 2009-2010 will receive advanced grade points for this class.**

I (2hr 9677CT) (3 hr-9676CT) II (2hr 9679CT) (3hr 9678CT)

Career Preparation I, II

- ⇒ *Grade Placement 11-12*
- ⇒ *Credit I 2-3 Units, II 2-3 Units*
- ⇒ *Prerequisite 16 years of age and Approval Process*

A work-based learning program that combines occupationally related classroom instruction and work-based experiences. Students work in a skilled occupation relating to communications and media, construction and maintenance, electrical and electronics, industrial and manufacturing, safety and security, metal technology, automotive/transportation or other specialty areas. Safety, entrepreneurship, leadership and career opportunities are included with work ethics and job related study in the classroom. Students must provide their own transportation to their training station. This course is offered at Klein High School.