



Informed · Safe · Healthy

MACHINE TOOL TECHNOLOGY

Safety and Health Curriculum for CTE Instructors

USER'S GUIDE

**HealthPartners Institute
July 2018**

DISCLAIMER

TECHS curriculum does NOT cover all hazards present in a machine shop.

Even if you teach all TECHS modules, your students will need additional information on how to recognize and correct the other hazards that may be present in a shop.

For example: there is no TECHS module on [metalworking fluids](#), which are known to cause various lung diseases and dermatitis (skin rash). Substantial evidence also shows that **past** exposures to some metalworking fluids were associated with increased risk of some types of cancer.



Introduction

The TECHS curriculum was developed using the principles of modern adult education: 1) students and their prior knowledge are placed at the center of the learning process; 2) new knowledge is presented in a manner immediately relevant to their trade; 3) safety and health is embedded in tasks and activities that students practice in the school shop; and 4) students are guided in their learning by using dialog (peer-to-peer and instructor-student) and self-reflection.

The hazards addressed by the TECHS curriculum were selected in collaboration with instructors at Hennepin Technical College and St. Cloud Technical and Community College. This curriculum was designed for delivery over the course of a two-semester academic year, with the “full” modules to be delivered in the first semester, and “refresher” modules to be delivered in the second semester.

If a program of study is a 2 years, we recommend delivering the TECHS modules in both years of the program. As students progress in their understanding and mastery of the trade, instructors will notice that students’ approach to safety and health will also change and the classroom discussions will be enriched. **It is critical that each TECHS module is taught within a course in which the specific hazards are encountered.**

Each module addressing a safety and health hazard includes information on: source of the hazard; means of exposure; health effects of exposure; hazard management through engineering and administrative controls; and personal protective equipment. Where applicable, information about what to do in case of emergency is also included.

Other TECHS Materials

A module on shop safety rules includes a presentation to be delivered at the beginning of each semester, a personal protective equipment (PPE) table (decision form), and a list of recommended safety rules for your shop.

Materials designed for instructors only: subject-specific self-assessment forms, and curriculum delivery tracking forms.



The TECHS Curriculum

The TECHS curriculum for Machine Tool Technology (MTT) programs includes the 7 “full” modules, 5 “refresher” modules, and an End-of-Year test.

FULL MODULES	REFRESHER MODULES
Electrical Safety	Electrical and Fire Safety
Fire Safety	
Eye Protection	Eye and Hearing Protection
Hearing Protection	
Machine Guarding	Machine Guarding
LOTO Awareness	LOTO Awareness
Material Handling	Material Handling

Each module includes the following components, described in detail on the following pages:

- ✓ Instructor’s Guide
- ✓ Student’s Guide
- ✓ PowerPoint presentation(s)
- ✓ Handout(s)
- ✓ Lab Activities (“full” modules only)
- ✓ Homework
- ✓ Quiz
- ✓ “I want to know more” folder



TECHS Module Components

Instructor's Guide (pdf)

This document contains a brief summary of the information covered by the module, a list of objectives, and information about the classroom, lab, and homework activities and materials. It may also contain alerts regarding items (sound clips) that you may verify work properly. **Review this guide prior to teaching a module.**

Student's Guide (pdf)

This document contains a brief summary of the information covered by the module, a list of objectives, and information about the classroom, lab, and homework activities and materials. **Students should receive this guide prior to each module delivery.**

PowerPoint Presentation (pptx)

The PowerPoint presentations are designed for in-person, in-class delivery. Each slide contains instructor notes, including questions for students and discussion points. All symbols used in the slide notes are explained on the first slide of each presentation. **Review each presentation before teaching it, to familiarize yourself with the image animations and ensure that all videos or sound files run properly.**

Handouts (pdf)

Handouts include slides and slide notes, in one pdf document. Handouts contain references to the videoclips shown in class.

Lab Activities (pdf)

Two to four lab activities give students opportunities to apply key concepts and information learned in class. If needed, modify any activity to suit your student group and/or shop equipment. There are no lab activities for the “refresher” modules. **Review the lab activities ahead of time to familiarize yourself with the materials that you may need.**



Homework (pdf)

One to three homework items require students to review and reflect upon key concepts learned in class or practiced in the shop. When applicable, students learn how safety and health applies to activities and products they use at home, as well as work. If an assignment refers to a text book you are not using, be sure to identify a different applicable option and modify an assignment as needed. **Discuss the homework assignments in class.**

Quiz (docx)

Five to 10 questions on the key concepts taught in class or in the lab. The quiz can be used as a teaching tool when discussed in class. A quiz key (pdf) is provided. **We recommend that the quiz is given after classroom presentation, lab activities, and homework have been completed.**

“I want to know more” Folder

Additional materials pertaining to the subject of the module, including reading materials referenced in some homework assignments. The folder may include fact sheets, accident investigation reports, newspaper articles, checklists, and additional hazard-specific information. **Review these materials ahead of time and familiarize yourself with the information your students are asked to read for some homework assignments. Give students access to this folder.** Contact TECHS with suggestions about additional documents that should be included.

The End-of-Year Test (pdf)

End-of-Year (EoY) test is the summative assessment of students' knowledge and skills at the end of the academic year. This test has 3 sections: Knowledge, Skills, and Work Practices.

Use the test key provided to grade the Knowledge section. **We recommend instructors include the EoY test results of the Knowledge section in the student's grade for the year.**

We do not recommend grading students on the Skills and Work Practices responses. However, these results will assist instructors with identifying the specific issues students need additional assistance with.

EoY test results provide critical feedback to help instructors improve their teaching practice.



Other TECHS materials

Shop Safety Rules

This module includes a personal protective equipment (PPE) table, (docx), a list of shop safety rules (docx), and a PowerPoint presentation (pptx) for classroom delivery. We recommend instructors use the materials in the following sequence:

- 1) Complete the PPE table for your shop. The information in this table constitutes the basis of some of the safety rules specific to your shop. Be sure all students review this information. Post this information in the shop.
- 2) Review the list of Shop Safety Rules. Add any additional rules specific to your facility or equipment. **We do not recommend removing any of the rules already listed.** Inform students the safety rules they are required to follow. Print the Shop Safety Rules on paper with your school's logo and post it in the shop, near the completed Hazards Assessment form.
- 3) Review the PowerPoint presentation. Add slides to cover information on the new safety rules you added to the Shop Safety Rules list (if any). Deliver the presentation to students, in class. **We recommend you deliver this presentation the beginning of each semester, before students work in the shop.**

Subject-specific self-assessment forms

These forms were designed to assist instructors with evaluating their knowledge of the safety and health topics covered by each TECHS module. **Complete these forms before teaching a TECHS module.** Compare your answers to the key provided. Be sure to review the materials referenced in the key.

Curriculum delivery tracking forms

We recommend instructors plan ahead and keep track of the TECHS modules delivered throughout each semester. Forms are provided for the “full” modules, “refresher” modules, and all modules. **Aim to deliver all TECHS materials during an academic year, but avoid delivering more than 2 modules on the same day. We do NOT recommend teaching all modules in the first week of class.** This method has been proven ineffective.

