

Revised by: C. Bertram
Reviewed by: R. Mallard
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Industrial Education Safety (IES) 1055 Excavation, Trenching and Soil Mechanics (1.25 Units)
[formerly Industrial Education Safety 55]

Prerequisite: None

Total Hours: 20 hours lecture

Catalog Description: This course focuses on Occupational Safety and Health Administration (OSHA) and California (Cal) OSHA standards and on the safety aspects of excavation and trenching. The course addresses practical soil mechanics and its relationship to the stability of shored and unshored slopes and walls of excavations. Various types of shoring (wood timbers and hydraulic) are covered. Testing methods are demonstrated and the use of instruments such as penetrometers, torvane shears, and engineering rods. This course is offered on a Pass/No Pass basis with the option to receive a letter grade.

Type of Class/Course: Degree Credit

Textbook: *29 CFR §1926 Construction Regulations*. Mangan Communications, Inc.: Davenport, Iowa, 2008. Print.

Cal-OSHA Construction and Electrical Safety Orders. Mangan Communications, Inc.: Davenport, Iowa, 2008. Print.

Additional Required Materials: None

Course Objectives:

By the end of the course, a successful student will be able to

1. explain basic concepts of soil mechanics and how environmental factors affect soil stability,
2. identify hazards related to excavations and excavating equipment,
3. describe sloping and shoring requirements and the use of trench shields,
4. identify the slope of trench walls to ensure employees receive protection,
5. demonstrate various field test of soil, including the pocket penetrometers and torvane shear methods,
6. list duties of competent person as defined by OSHA,
7. identify excavation standards, and
8. document excavation inspections.

Course Scope and Content:

Unit I Scope and Definitions

- A. 29 Code of Federal Regulations (CFR) 1926.650
- B. California Code of Regulations (CCR) §§1539 thru 1542

Unit II Soil Mechanics and Soil Classification

- A. OSHA Subpart P
- B. Cal-OSHA Permit Requirements §1539
- C. Methods of Protection

Learning Activities Required Outside of Class: None



Methods of Instruction:

1. Lecture
2. Group exercises in class
3. Workshops

Methods of Evaluation:

1. Written final exam
2. Performance observation