

# Geothermal System Installation eLearnings | Geothermal Energy Training

Introduction to Geothermal Heat Pump Systems - WX12305-XB01UEN-E2

Objective 2: Define the Mechanical Refrigeration Cycle and Explain Its Importance



Icebox Refrigeration

Before mechanical refrigeration was invented, the only method of cooling was to use an icebox, which was an insulated box that held a block of ice.

The insulation slowed heat transfer into the box, allowing the ice to remain frozen for an extended period of time.

However, the ice could only be kept for a few days before it needed to be replaced.

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## eLearning Course: M12305

Amatrol's Geothermal System Installation online training course moves from an introduction about geothermal energy to overall system performance evaluation. Learners begin with an introduction to geothermal heat pump systems and move rapidly into the concepts and components that make a geothermal system operate; these include closed-loop circuits, compressors, closed-loop circuits, compressors, condensers, evaporators, metering devices, refrigerants, suction line accumulators, receivers, dryers, moisture indicators, thermostats, controllers, blowers, heat-pump system start-up and operation, and overall system performance.

## Teach Geothermal Energy

### What is the Definition of Geothermal Energy?

The word geothermal is from the Greek words geo (earth) and therme (heat). Therefore, geothermal energy is energy that comes from the heat inside the earth. Geothermal energy is present in the earth because of the heat generated at its core and the solar energy absorbed at its surface.

### Hot Stuff!

One form of geothermal energy is generated as heat at the earth's core, which is about 6,400 km (4,000 mi.) below the surface. The core temperature of the earth is typically estimated to be 3,000-5,000 degrees Celsius (5,400-9,000 degrees Fahrenheit). Another form of geothermal energy is heat just below the earth's surface that comes from absorbed solar energy. This heat causes the sub-surface temperature to remain in a constant range throughout the year, regardless of the weather on the surface. For example, across the United States, the earth's temperature at about 3.5m below the surface has a range of about 3-22 degrees Celsius depending on the latitude.

## Interactive, Engaging Multimedia

### Geothermal System Installation eLearning

Amatrol's [extensive, thorough multimedia](#) covers the basics of geothermal energy. This course allows learners to study about this ever-growing field and build knowledge across a broad spectrum of topics, including system start-up and operation to shut down and maintenance. All of these topics feature in-depth text and audio with rich,

vibrant 3D animations, photos, videos, and interactive quizzes and activities. This offering of various learning methods fully engages the learner and further ingrains the course's knowledge. (References [950-GEO1](#), [1D](#), [2](#), & [2D](#))

### **Virtual Simulator**

Amatrol's eLearning curriculum is unique in that it thoughtfully combines in-depth theoretical knowledge with practical, hands-on skills. This powerful combination of knowledge and skills solidifies understanding and creates a strong foundation for pursuing more advanced skills.

### **Additional Info**

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#### **Requirements:**

- Computer (See [Computer Requirements](#))

#### **Referenced Equipment:**

- Geothermal Learning System (950-GEO1)
  - Geothermal Learning System with Desuperheater ([950-GEO1D](#))
  - Geothermal Troubleshooting Learning System ([950-GEO2](#))
  - Geothermal Troubleshooting Learning System with Desuperheater ([950-GEO2D](#))
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