

## IGSHPA Certification (CGD)

### Certified GeoExchange Designer Plus Course - Online

[Register for this class](#)



**Course Length:** 10 Week

**Class Hours:** 7:00 PM to 9:00 PM CDT (GMT -5:00)

7:00 PM to 9:00 PM CST (GMT -6:00)

**Full Course / Materials / Exam Cost:** \$1,795 (30 days prior) - \$1,995 (less than 30 days prior)

**Classroom Only Option** (no materials or exam): \$1,195 (30 days prior) - \$1,395 (less than 30 days prior)

GTI classes are also available for private instruction. To place a request, fill out our [Class Request form](#).

### Summary

Become a Certified GeoExchange Designer (CGD) with training brought to you through the combined efforts of the International Ground Source Heat Pump Association (IGSHPA), the Geothermal Heat Pump Consortium (GHPC), and the Association of Energy Engineers (AEE). As an architect or engineer, you have specific questions about GSHP systems that you want answered. IGSHPA has designed a program to offer advanced training towards certification as a GeoExchange Designer (CGD). From an introduction to the technology to a complete review of the design process, participants learn the specific information they need to know. IGSHPA has entered into a cooperative endeavor with the Association of Energy Engineers (AEE) and the Geothermal Heat Pump Consortium (GHPC) to provide training for the Certified GeoExchange Designer Program.

### Who Should Attend

The Certified GeoExchange Designer Plus course is designed for professional engineers, registered architects, installers, and contractors. This course is essential for individuals wanting advanced training and experience in designing GSHPs, and required for experienced individuals who wish to earn certification.

### Objectives

Your accreditation by IGSHPA is your demonstration that you are committed to the industry, and you know how to do the job right. This review course, when coupled with your experience as a geothermal professional, prepares you to make application for your CGD Certification and complete the CGD examination. The CGD Certification process is a multi-step effort that is administered under the auspices of IGSHPA and AEE. This course is a requirement for successful application and completion of the CGD Certification.

### Prerequisites

Each candidate for certification must meet one of the following four sets of criteria:

- Be an engineering graduate and/or Professional Engineer or Registered Architect with three years combined experience in commercial geothermal heat pump design and/or heating, ventilation and air-conditioning
- Have a four-year, non-technical degree with five years combined experience in commercial geothermal heat pump design and/or heating, ventilation and air-conditioning.
- Have a two-year technical degree with eight years of combined experience in commercial geothermal heat pump design and/or heating, ventilation and air-conditioning.
- Have ten years or more of combined experience in commercial geothermal heat pump design and/or heating, ventilation, and air-conditioning.

## Certification Process

Certification is accomplished by application to the Association of Energy Engineers (AEE). To become certified the candidate must:

- Determine if eligible under the Eligibility Requirements listed.
- Register for and attend the IGSHPA CGD or CGD Plus Workshop.
- Pass the IGSHPA CGD exam.
- Complete a separate application to be submitted to AEE, initiating the certification process.
- Certification will be awarded by AEE after the CGD Board's evaluation of the candidate's qualifications.

Attending the CGD Workshop and passing the CGD exam are only a part of the certification process. To receive certification, the steps below must be followed:

- **Students Ready to Apply for CGD:**

If you have sufficient experience and are ready to make application for CGD, you must complete the long application form and submit it to the Association of Energy Engineers (AEE) after completing the CGD or CGD Plus course. After you have made application, you need to contact IGSHPA to obtain your online testing User ID and Password. After you pass the exam, the CGD board will review your application and make the decision for awarding certification.

- **Students Not Yet Ready to Apply for CGD:**

If you do not currently have the experience necessary to meet the qualifications for the CGD, you can become a CGD in training. You need to complete the short application form and submit it to the Association of Energy Engineers (AEE) after completing the CGD or CGD Plus course. Doing this will enable you to take the exam now and your results will be retained on file until you are ready to make full application. During the interim you will be designated as a CGD in training. After submitting the short application form, you need to contact the IGSHPA for your online testing User Id and Password.

*Please Note: No Student will be given online testing User ID & Password until IGSHPA has verified that your application is on file with AEE.*

## Materials Received

Participants in the full course will receive a copy of the Closed-Loop / Ground-Source Heat Pump Systems Installation Guide, as well as other manuals in the CGD Notebook.

## Topics Covered\*

The course is broken into sections to facilitate a practical approach to establishing a baseline for each successive topic. The sessions are interactive and are intended to promote discussion between participants and the instructor.

- **Introduction to Commercial Geothermal System Design**
- **Feasibility of Geothermal System**
  - Energy Modeling
  - Mechanical System
  - Site Geology
  - Preliminary GHX Model
  - Economic
- **Confirmation of Feasibility (TC Testing)**
- **System Design**
- **Ground Heat Exchanger Design**
- **Mechanical Systems Design**
- **Specifications and Documentation**
- **Design Implementation**
  - Construction
  - Commissioning / Owner Training
  - Quality Assurance / Quality Control

\* Note: The course outline is guidance only. The specifics may be modified by the instructor based upon the class flow.

\*Course length/cost are based on a min. of eight attendees. GTI reserves the right to cancel or reschedule classes.

[Register for this class](#)

## Full Course Outline

### **Week 1:** **Introduction to Commercial Geothermal System Design**

### **Week 2:** **Feasibility**

- 2.1 Building loads
  - 2.1.1 Peak loads
  - 2.1.2 Energy loads
  - 2.1.3 Energy balance
  - 2.1.4 Reducing & balancing building loads
  - 2.1.5 Energy modeling software requirements

### **Week 3:** **Mechanical System**

- 2.3.1 Equipment efficiency
- 2.3.2 Distribution system
- 2.3.3 Ventilation strategy
- 2.3.4 Energy storage

### **Week 4:** **The Site and Geology**

- 2.2.1 Land area available for GHX
- 2.2.2 Geology
- 2.2.3 Regulations

### **Week 5:** **GHX Preliminary Modeling**

- 2.4.1 Vertical
- 2.4.2 Horizontal
- 2.4.3 Pond / lake
- 2.4.4 Open well
- 2.4.5 Standing column
- 2.4.6 Hybrid options
- 2.4.7 GHX software requirements

### **Week 6:** **Economics**

- 2.5.1 Energy cost comparison
- 2.5.2 Capital cost

## **Week 7:**

### **Confirmation of Preliminary Design**

- 3.1.1 TC testing – vertical GHX
- 3.1.2 TC testing – horizontal GHX
- 3.1.3 Pump testing – open well

## **Week 8:**

### **System Design**

- 4.1 Configuring the GHX
  - 4.1.1 GHX nomenclature
  - 4.1.2 Pipe selection
  - 4.1.3 Heat transfer fluid
  - 4.1.4 Number of GHX circuits
  - 4.1.5 Flushing / purging considerations
  - 4.1.6 Supply / return header configuration
  - 4.1.7 Supply / return runouts
  - 4.1.8 Geothermal vaults
  - 4.1.9 Building penetrations
  - 4.1.10 Supply & return manifolds
  - 4.1.11 Pumping strategies and options

## **Week 9:**

### **Designing the Mechanical System**

- 4.2.1 Water to air equipment
- 4.2.2 Distribution system considerations
- 4.2.3 Water to water equipment
- 4.2.4 Distribution system considerations
- 4.3 Drawings & Specifications
  - 4.3.1 Equipment specifications
  - 4.3.2 Connection details
  - 4.3.3 Piping material specifications
  - 4.3.4 GHX details

## **Week 10:**

### **Implementation**

- 5.1 Construction
  - 5.1.1 Quality assurance / quality control considerations
  - 5.1.2 Pre-construction site meetings
  - 5.1.3 Site inspections
- 5.2 Commissioning the system
  - 5.2.1 Commissioning
  - 5.2.2 Functional performance testing
  - 5.2.3 Operator training / turnover of system

**Revisions:**

11/17/2011	Updated the Course Objectives
10/26/2011	Added option for class only (no materials or exam)
9/27/2011	Reviewed and updated by Ed Lorenz
9/7/2011	Added full outline specifics; pricing; weekly breakdown
3/10/2011	Initial Course Outline