



Indoor Environmentalist - Intermediate Level

Course Syllabus

The Indoor Environmentalist course is an Intermediate Level training program designed to assist with the development of professionals interested in providing indoor environmental quality (IEQ) investigations, reporting results and make recommendations for solutions to IEQ problems in commercial buildings. The course is taught over a two-day period.

This course adds to the fundamentals learned as part of the Indoor Environmentalist Fundamentals course and is focused on commercial buildings such as schools, hospitals, office buildings, etc. It also serves as a stand-alone course for those with IEQ experience or those operating commercial buildings. There is limited instruction specialty IEQ topics such as lighting, sound and ergonomics. *This course does not provide certification or licensing for regulated areas such as asbestos, lead paint and radon although there is discussion of these topics.*

Those attending the intermediate level course are typically people who have experience performing residential investigations that would like to learn more about commercial buildings and the owners and operators of commercial buildings. All indoor environmentalists should maintain a strong team of professionals to assist them when needed. Examples of the type of team members include laboratories, legal professionals, building scientists, medical professionals, industrial hygienists, energy auditors, HVAC engineers and mechanics, and others. IEQ issues often times involve the health of occupants and anytime you are dealing with health issues it is vital to know your limits and know who to call when you reach those limits.

Day One –AM

Review of Key Points from Fundamentals Level

Much of this review can be accomplished prior to the course through supplemental online assignments such as reading chapters from the Fundamentals program and/or watching videos from the Fundamentals course.

Chapter 1 – Indoor Environmental Quality Investigations (Commercial)

Chapter one of the Indoor Environmentalist – Intermediate Level provides students with an overview of differences between doing investigations in residential and commercial properties. The first topic is contrasting diagnostics in Industrial vs. Commercial/Residential Facilities and comes from the EPA IAQ Building Education and Assessment Model I-BEAM. From there we discuss some common IEQ problems and complaints in commercial buildings and we finish up by reviewing the best references for commercial IEQ investigations including a thorough review of the OSHA document “Indoor Air Quality in Commercial and Institutional Buildings.” Upon completion of this chapter students will be able to:

- Contrast diagnostics in industrial vs. commercial/residential facilities
- Recognize common causes of IEQ problems & complaints in commercial buildings
- Select appropriate references for IEQ Consultants
- Understand the key concepts in the document from OSHA “Indoor Air Quality in Commercial and Institutional Buildings”

Chapter 2 – IEQ Guidelines, Standards, Codes & Regulations

Chapter two of the intermediate level course focuses on IEQ Guidelines, Standards, Codes and Regulations with a focus on commercial buildings. We discuss and review guidelines standards and codes that are directly related to IEQ in commercial buildings. We begin with an overview of what the difference is between these various types of documents. So how is a code different from a regulation and so forth. Then we go into detail on different regulations and codes related to IEQ examples that include the asbestos regulations such as 40 CFR Part 763 National Emissions Standard for Hazardous Air Pollutants. We continue by reviewing how standards and guidelines differ and go into detail on standards and guidelines related to commercial buildings such as ASHRAE Standard 62.1 Ventilation for Acceptable Indoor Air Quality. We finish up with a discussion of exposure limits and how they can be used to help inform IEQ investigations. Upon completion of this chapter students will be able to:

- Summarize the difference between Guidelines, Standards and Codes
- Recognize Regulations & Codes related to IEQ
- Recognize Standards & Guidelines related to IEQ
- Analyze how exposure limits are related to IEQ issues

Day One - PM

Chapter 3 – Industrial Hygiene and IEQ

Those performing IEQ investigations in commercial buildings should be knowledgeable about the art and science of industrial hygiene. Commercial building managers and owners are often times more concerned about legal liabilities and have often times already been exposed to working with industrial hygienists on some IEQ related issue such as asbestos, lead paint, etc. This makes it even more important for those doing commercial IEQ work to be well versed in industrial hygiene. We start this chapter with a review of the excellent OSHA document “Industrial Hygiene” and then go into how to use the two most popular industrial hygiene reference books. Within both of these books there is extensive information that is applicable to IEQ investigations. In addition we will discuss some basic toxicology and get a little dose of toxicology. Upon completion of this chapter attendee’s will be able to:

- Discuss the definition of industrial hygiene from the OSHA document “Industrial Hygiene”
- Recognize the helpfulness of references such as “The Occupational Environment: Its Evaluation, Control, and Management” for assistance on IEQ projects
- Discuss the recommendations on specific IEQ issues within the selected indoor air contaminants fact sheets from EPA
- Discuss what toxicology is and how it is used to understand some health effects related to IEQ

Chapter 4 – The Science of IEQ and Building Science (Commercial Buildings)

This chapter of the Intermediate Level Indoor Environmentalist goes into more detail on the science behind IEQ investigations and building science with an emphasis on commercial buildings. We will review how to convert from one unit of measurement to another when necessary and we will discuss psychrometrics, water activity and other moisture issues. As part of this section we include a review from a case study of a commercial building IEQ investigation that relied heavily on building science. Upon conclusion of this chapter attendee’s will be able to:

- Convert units of measurement
- Understand Psychrometrics and IEQ
- Discuss a case study of commercial building IEQ and building science

Chapter 5 – Heating Ventilation and Air Conditioning Commercial Buildings

The heating ventilation and air conditioning (HVAC) system in commercial buildings can be both the source of and transport mechanism for indoor contaminants. In this chapter we look at the types of commercial HVAC systems and the different types of components and equipment that are part of these HVAC systems. Indoor Environmentalists must have a good understanding of how HVAC systems work and what can go wrong when they are not working properly. The large variety of commercial HVAC systems can be a challenge for IEQ professionals and this chapter is designed to give them a solid foundation on commercial systems on which to build. We also provide resources for further study and understanding of HVAC systems. It is important for attendees to recognize that this is only the foundation and that they will most often need to continue their studies in this important area. Upon completion of this chapter attendee's will be able to:

- Explain what HVAC is and why it's important when it comes to IEQ issues
- Discuss how HVAC and IEQ are inextricably linked
- Describe the different types of commercial HVAC System Types
- Describe various types of commercial HVAC equipment and components

Day Two - AM

Chapter 5 – Heating Ventilation and Air Conditioning Commercial Buildings (cont.)

Chapter 6 – IEQ Diagnostics and Sampling

A discussion of more advanced type of diagnostics and sampling. Some topics include blower door testing, thermography, tracer gas testing, smoke testing, testing and balancing. Upon completion of this chapter attendee's will be able to:

- Recognize when more advanced types of diagnostics and analysis may be appropriate on a projects.
- Understand the options for more advanced types of diagnostics and analysis on IEQ projects

Chapter 7 – Assessment of Indoor Environments (Commercial)

Using the I-BEAM forms and framework we do a mock survey of a commercial building. Attendees are walked through the building with an experienced indoor environmentalist. During the walk through attendees will note observations and take measurements as needed.

Day Two - PM

Chapter 8 – Indoor Environmental Contracting

Understanding the types of indoor environmental contracting available and when to use them is the focus of this chapter. Subjects to be discussed include developing a scope of work, supervision of projects, contract documents, insurance issues and clearance/completion of IEQ Contracting Projects

Chapter 9 – IEQ Professionals, Services and Reports

Review of guide to identifying IEQ professionals and examples of the types of reports used for commercial building projects. IEQ professionals have numerous options on how to report their findings depending on the type of investigation taking place. We will review a simple form of report writing up to a complex report developed by NIOSH and CDC. This helps participants understand the depth and breadth of reporting options available for use on commercial projects.

- Ultra-quick Guide – Identifying Professionals
- Report Writing for commercial building projects
- Discussion of example reports