

INDOOR AIR QUALITY

COURSE OUTLINE

- **We can't see it, and we don't think about it very often, but it's all around us, and it's vital to our life and health.**
- **The air that we breathe is something we tend to take for granted.**
 - If that air becomes contaminated it can lead to discomfort, fatigue and even serious health problems.
 - This is especially true of the air inside the buildings where we live and work.
 - Most of us spend as much as 90% of our time indoors.
- **Indoor air can contain significantly higher levels of contaminants than outdoor air.**
 - According to the Environmental Protection Agency (the EPA), unhealthy indoor air is currently one of the top five threats to public health.
- **Many of the contaminants that can make indoor air unhealthy are invisible to the naked eye, but you can still tell when they're present, because of the way they make you feel.**
 - Contaminated air can irritate the mucous membranes of your eyes, nose and throat, sometimes even your skin.
- **Breathing “bad” air can also bring on coughing, sneezing, shortness of breath, headaches, dizziness and fatigue.**
 - Exposure to airborne contaminants may eventually lead to even more serious health problems, such as asthma and emphysema.
- **Different people can react to bad air in different ways, but any of these symptoms could indicate that there is a problem with the air in your building, especially if you experience them repeatedly.**
- **When a person's health problems can be directly linked to poor air quality in a building, that set of symptoms they are experiencing is called a “building-related illness”.**
 - Identifying the cause of bad air can often be a challenge.

- **You may also have heard of a condition known as "Sick Building Syndrome". This occurs when:**
 - A large number of people in a building experience various health problems.
 - Their symptoms disappear when they leave the building.
- **Even a professional air quality investigation may not be able to discover what is causing the symptoms.**
 - Something in the building seems to be the culprit, but what that thing is can be a mystery.
- **Even if the cause of the bad air can be identified, this is only the beginning of dealing with it.**
 - The problem must be corrected and prevented from occurring again in the future.
- **The three main factors that affect the quality of indoor air include:**
 - The building's HVAC system.
 - Sources of contamination both inside and outside the building.
 - The people who occupy the building.
- **A "heating, ventilation and air conditioning" system, or "HVAC", controls the temperature, humidity and circulation of air throughout a facility.**
- **Depending on the building's size and the activities that go on inside it, the system can be fairly complicated.**
 - To do its job correctly, the system must be customized for the facility and “balanced” for the different areas within it.
- **Any problems with the design or operation of an HVAC system can significantly affect the quality of the air that is delivered to the occupants of the building.**
 - If a system does not filter the air correctly, or its filters become dirty or clogged, the system could actually spread contaminants throughout the facility.
 - Regular inspections of the system, including its filters, can prevent this and other problems.

- **What you do can also affect how well the HVAC in your building works.**
 - Changing a thermostat's setting may make you more comfortable, but it can disturb the balance of the system, which could cause trouble for others.
 - So you should leave thermostats alone unless you have been authorized to adjust them.
- **Other "fixes", like adding fans to your work area or blocking air vents, can affect the way the HVAC functions as well.**
 - You shouldn't make these types of changes without first consulting your supervisor.
- **While humidifiers and dehumidifiers can help to control the amount of moisture in the air around you, you should check with your supervisor before using them, too.**
 - They can conflict with your facility's HVAC, or possibly damage equipment or materials in the facility.
- **The same goes for portable air cleaners and ionizers.**
 - They can be effective for removing dust and other contaminants from indoor air, but could cause other problems.
- **If you are permitted to use these types of devices, be sure to clean their filters, reservoirs and drip pans.**
 - Always follow the manufacturer's instructions for servicing them.
 - Without regular maintenance, they can make the air quality worse instead of better.
- **To keep the air in a building healthy, any sources of contamination, either inside or outside of the structure, must be identified, then eliminated or controlled.**
- **A variety of cleaning products are used in most buildings.**
 - Adhesives, solvents and other chemicals may also be present.
 - All of these can release "volatile organic compounds" (VOCs) into the air.
- **The health effects of VOCs can range from eye, nose, and throat irritation to liver and kidney damage, possibly even cancer.**

- **Furniture, carpeting, paint and some types of construction materials can release VOCs that were used in manufacturing them.**
 - This process is known as "off-gassing".
 - "Off-gassing" can be especially severe in buildings that are new, or recently remodeled or renovated.
- **Another common indoor contaminant is dust.**
 - When it's stirred up into the air, dust can irritate the eyes, nose, and throat, and not just for people who are allergic to it!
- **A safe way to reduce airborne dust is by wiping down surfaces regularly with a damp cloth or towel.**
 - If you work in an area or with a process that produces a lot of dust, you may want to talk to your supervisor about wearing a filter mask or other respiratory protection.
- **Asbestos fibers and lead dust are two especially hazardous substances that can be found inside some buildings.**
 - Inhaling either of these materials can lead to serious physical damage, disease and even death.
 - Requirements for identifying, controlling and removing these contaminants in public and private buildings are strictly enforced by OSHA, the Centers for Disease Control and the EPA.
 - Your employer will tell you if there are any lead or asbestos hazards in your workplace.
- **Air contaminants that can come in from outside your building include:**
 - "Natural" substances such as dust, pollen and fungi spores.
 - "Man-made" materials such as pesticides, chemicals and pollutant emissions.
- **Outdoor contaminants like these can get inside through open doors or windows, or even the air intake vents of your building's HVAC.**
- **Carbon monoxide is a hazardous gas that can originate outside the building in exhaust emissions from cars, trucks, and other vehicles, as well as inside from leaking furnaces, chimneys or flues and from gas, propane or diesel-powered forklifts.**

- **Standing water can collect outside on rooftops in wet weather, or inside from leaky pipes or other sources, and provide a breeding ground for bacteria and mold.**
 - Water stains or other damage could indicate that this is happening in your building.
 - If you see clues such as these, notify your supervisor so the problem can be addressed.
- **The third factor that can significantly affect indoor air quality is "us", the people who work in a building.**
- **There are things that we can do, and avoid doing, that can improve the quality of the air we breathe on the job.**
 - Leaving leftover food sitting around gives bacteria, mold, and fungus a place to grow and flourish.
 - Used soft drink, coffee and milk containers will do the same thing.
 - Even a half-empty cup of water can become a source of contamination!
 - You can prevent this by refrigerating or throwing away all leftovers.
- **Bacteria, mold, and fungus can also grow in trash, so make sure waste bins are emptied and cleaned on a regular basis.**
- **Tobacco smoke can be hazardous to everyone, smokers and non-smokers alike.**
 - To protect employees who don't smoke from the air contaminants created by those who do, many employers have created dedicated smoking areas that are set apart from the rest of the facility or have banned smoking in the facility altogether.
- **If you smoke, be sure to:**
 - Follow your facility's smoking policy.
 - Smoke only in designated areas.
- **Cleaning products, solvents, and other chemicals can affect the quality of the air we breathe indoors, but you can reduce their impact significantly by following safe "housekeeping" practices when you use them.**
 - Re-seal cleaners and other chemical containers when they're not in use.
 - Store them properly.
 - Clean up any leaks or spills immediately.
 - Place all contaminated rags, towels or other materials in a covered container or sealed bag.

- **In some situations, extra ventilation or respiratory protection may be required to deal with these situations.**
- **If you notice any potential sources of air contamination or other air quality problems in your workplace, you should notify your supervisor at once.**
 - If the problem is more than they or other staff members can handle, professionals will be called in to investigate the situation.
- **In general, you should try to keep clear and let these people do their work, but you may be asked to assist with the investigation.**
 - This could range from showing someone around your work area, to answering a few questions, to filling out a questionnaire.
 - Your participation can be essential to finding and fixing any air quality problems, so you need to provide any help that you can.

***** SUMMARY *****

- **Contaminated indoor air can cause short-term discomfort as well as more serious health problems.**
- **Set up correctly, a building's HVAC system can help reduce air contaminants.**
- **Ask your supervisor before making any changes in your workplace that could affect the HVAC.**
- **Sources of indoor air contamination include dust, pollen, fungi, pesticides, chemicals, industrial pollutants, lead and asbestos.**
- **You can help ensure healthy air in your building by following good housekeeping practices and handling chemicals carefully.**
- **Report any air quality problems or sources of contamination to your supervisor immediately.**
- **Now that you understand the hazards that can exist in indoor air, and know the types of contaminants to look for as well as what to do if you find them, you can help yourself and everyone else in your facility "breathe easier"... every day!**