

## Content Domains:

<p>I. Basic Sciences Chemistry Physics Biology Mathematics</p>	<p>V. Program Management Principles Investigation methods (e.g., root cause, incident investigation) Ethics Risk communication Guidelines and standards Data management and integration Emergency response</p>
<p>II. Occupational Disease, Illness, Injury and Surveillance Biostatistics Epidemiology Toxicology</p>	<p>VI. Evaluation Practices Instrumentation Sampling methods/techniques Analytical chemistry</p>
<p>III. Health Hazards Ergonomics/human factors Physical stressors Biological stressors Chemical stressors</p>	<p>VII. Hazard Controls Engineering PPE Administrative</p>
<p>IV. Work Environments Indoor air Industrial processes</p>	<p>VIII. Community Stressors Air pollution Hazardous waste</p>

## CONTENT DOMAIN DEFINITIONS

### I - Basic Sciences

General scientific concepts, anatomy and physiology, biochemistry, biology, chemistry, mathematics and physics. Properties of flammable, combustible and reactive materials (compatibility) are included. Included are calculations such as those relative to gas laws, airborne concentrations, unit-of-measure conversions and conditions of non-standard pressure.

### II - Occupational Disease, Illness, Injury, and Surveillance

- **Biostatistics:** Basic biostatistics and statistical and non-statistical interpretation of data in the evaluation of hazards.
- **Epidemiology:** Principles of epidemiology, techniques used to study the distribution of occupationally induced diseases and physiological conditions in workplaces and factors that influence their frequency. It includes concepts of prospective and retrospective studies, morbidity and mortality and animal experimental studies, data and distribution of data.
- **Toxicology:** Included are symptomatology, pharmacokinetics, mode of action, additive, synergistic and antagonistic effects, routes of entry, absorption, metabolism, excretion, target organs, toxicity testing protocols and aerosol deposition and clearance in the respiratory tract.

### III - Health Hazards

- **Biological stressors:** Principles of sanitation, personal hygiene, the hazards of biological agents or materials having the capacity to produce deleterious effects upon other biological organisms, particularly humans (virus, bacteria, fungi, molds, allergens, toxins, recombinant products, bloodborne pathogens, etc.) and infectious diseases that appear in workplaces including industry, agriculture, offices and health care facilities.
- **Chemical stressors:** Health effects resulting from exposure to chemical substances. Also included are carcinogenic, mutagenic, teratogenic and reproductive hazards.
- **Ergonomics/human factors hazards.**
- **Physical stressors:** Health effects resulting from exposure to noise and vibration.  
Physical characteristics and health and biological effects associated with ionizing radiation - alpha, beta, gamma, neutron and x-radiation, including source characteristics. Physical characteristics and health effects associated with nonionizing radiation - electromagnetic fields, static electric and magnetic fields, lasers, radio frequency, microwaves, ultraviolet, visible, infrared radiation and illumination.  
Adverse health effects associated with thermal stressors - heat and cold, symptoms of temperature-related health effects.

### IV - Work Environments

Included are the hazards associated with specific industrial or manufacturing processes. Topics include, but are not limited to confined space entry, spray-painting, welding, abrasive-blasting, vapor-degreasing, foundry operations, and general indoor environmental issues.

### V - Program Management Principles

- Acquisition, allocation, and control of resources to accomplish industrial hygiene recognition, evaluation and control objectives in an effective and timely manner. Included are such topics as data management and integration, emergency planning and response, ethics, guidelines and standards, investigation methods, (e.g. root cause, incident investigation), and risk communication.
- Ethics includes practical knowledge of the ABIH Code of Ethics.
- Guidelines and standards includes the understanding of principles and requirements for the interpretation and use of guidelines and standards for the assessment of health hazards, including American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs), Biological Exposure Indices (BEIs) and industrial ventilation guidelines, American National Standards Institute (ANSI) standards, American Society for Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) guidelines, American Society for Testing and Materials (ASTM) standards and National Institute for Occupational Safety and Health (NIOSH) Criteria Documents and recommendations.
- Hazard communication and training of employees are included.

## **VI - Evaluation Practices**

- Analytical chemistry: Procedures for workplace environmental samples and related calculations.
- Instrumentation: Included are gas chromatography, infrared, visible and ultraviolet spectrophotometry, high performance liquid chromatography, mass spectroscopy, atomic absorption spectrophotometry, wet chemical methods, and microscopy and laboratory quality assurance and chain of custody.
- Sampling methods/techniques: Selection, use, and limitations of field sampling instruments, full-shift and grab samples, including direct-reading instruments. Included are the set-up, calibration and use (including quality assurance practices) of sampling apparatus and direct-reading instruments. Sampling strategy considerations and measurement of exposures to health hazards are included. Calculations related to sampling and calibration are included. Computations related to combining noise sources and octave band measurements are included as are audiometric testing programs. Includes evaluation of control options to identify or design appropriate methods.

Reference:

ABIH Candidate Handbook  
Certified Industrial Hygienist – CIH  
April 2008

## **VII - Hazard Controls**

- Administrative
- Engineering: Included are local exhaust ventilation, dilution ventilation, isolation, substitution, containment and process change. Also included are in-plant recirculation air-cleaning technology, mechanics of airflow, ventilation measurements, design principles and related calculations. Application of ergonomic principles from anthropometry, human factors engineering, biomechanics, work physiology, human anatomy, occupational medicine, and facilities engineering to the design and organization of the workplace for the purpose of preventing injuries and illnesses. Control of noise and vibration sources includes principles of isolation, absorption and damping. Control of ionizing and nonionizing radiation hazards, thermal stressors and biological hazards.
- Personal Protective Equipment: Including the principles governing selection, use and limitations of respirators and protective clothing. Included are respirator fit testing, breathing air specifications, glove permeability and eye protection.

## **VIII - Community Stressors**

Hazardous waste, air pollution, air cleaning technology, ambient air quality considerations, emission source sampling, atmospheric dispersion of pollutants, ambient air monitoring, health and environmental effects of air pollutants and related calculations.