

M200 Module Syllabus

Basic Principles in Occupational Hygiene

Teaching Aims

This course aims to provide an introduction to outline the broad principles in occupational hygiene as the basis for anticipation, recognition, evaluation, and control of hazards that can be encountered in the workplace.

Prior Knowledge and Understanding

There are no prerequisites required for this qualification, however, Health and safety professionals, occupational health specialists (including physicians and nurses) and people interested to enter into the field of occupational hygiene will find this course beneficial.

Specialists in subjects such as acoustics, ergonomics, human factors, occupational psychology, work organisation, biosafety, acoustics, engineering, or analytical chemistry who want a broader appreciation of how their role interfaces with other professions over health issues in the workplace would also benefit from this course.

Learning Outcomes

On completion of this course, candidates will have a basic understanding of the following:

- **The value of occupational hygiene and the role of the occupational hygienist**
- **The Range of Physical and Chemical Hazards in the Workplace**
- **Hazard Recognition Techniques and Potential Routes and Sources of Exposure**
- **Hazard Evaluation, Measurement Processes and Assessment of Exposures**
- **Methods of Hazard Control and Exposure Controls**
- **Management of Occupational Hygiene Programmes**
- **UK Health and Safety Legislation**

Content

The syllabus is structured into six sections:

| | | Approx Time Allocation |
|----------|---|-------------------------------|
| 1 | Introduction to Occupational Hygiene | 5% |
| 2 | Human physiology | 15% |
| 3 | Recognition of chemical hazards | 20% |
| 4 | Recognition of physical hazards | 20% |
| 5 | Evaluation of hazards | 20% |
| 6 | Control of hazard | 20% |

Note:

Reference is made in this syllabus to HSE guidance and other documentation. This list may not include the most up-to-date relevant publications from HSE and other sources and is intended as guidance for candidates only.

1 Introduction to Occupational Hygiene (5%)

This section will provide candidates with a broad introduction to and overview of Occupational Hygiene including the history and background of the development of occupational hygiene.

On completion of this section, candidates will be able to demonstrate good understanding of the following:

- 1.0.1 The definition of occupational hygiene
- 1.0.2 A history and background surrounding the development of occupational hygiene
- 1.0.3 The importance of occupational hygiene
- 1.0.4 An overview of qualifications and careers in occupational hygiene

2 Human Physiology (15%)

This section will provide candidates with an introduction to basic principles of physiology of the human body and how occupational exposure to chemical and physical agents can affect the human body.

On completion of this section, candidates will be able to demonstrate a good understanding of the following:

- 2.0.1 General metabolism

- 2.0.2 The respiratory system
- 2.0.3 The circulatory system
- 2.0.4 Sight
- 2.0.5 Hearing
- 2.0.6 Heat regulation

3 Recognition of Chemical Hazards

This section will provide candidates with a basic understanding of the principles of risk assessments, hazard definitions and risk, and basic information on expert systems and control banding.

It also covers terminology used and information gathering.

In order to achieve this the candidate will be able to demonstrate their understanding of the following:

- 3.0.1 Hazard and risk definitions along with gathering information from various sources such as:

- Safety data sheets
- Guidance documents
- Literature, websites etc.
- COSHH essentials

- 3.0.2 Basic principles of toxicology and effects on the body such as:

- Routes of entry into the body (inhalation, ingestion, absorption)
- Metabolism
- Effects on the body (acute, chronic, systemic, and localised)
- Types of effect (asphyxiation, irritation, trauma, poisoning)
- Toxicity testing

- 3.0.3 Material forms:

- Gases, vapours, aerosols
- Dusts (respirable and inhalable)
- Fumes
- Vapour pressure

- 3.0.4 Hazard processes: where common hazardous substance/processes may occur and the effects they may have on the body. (Please note that processes listed below are examples. At least one from each group will be covered during the course. Individual processes will not be examined.)

Mineral materials, such as:

- Silica (quarrying and mining, brick, tile and refractory manufacture, pottery and ceramic, sandblasting, glass manufacture)

- Asbestos (uses, building surveys, sampling and analysis, remediation/removal)
- Machine made mineral fibre (MMMMF) manufacture and utilization

Metal processes, such as:

- Metal refining (furnaces, foundries, casting)
- Machining (cutting, grinding, polishing)
- Treatments (degreasing, plating, pickling, anodising)
- Welding (arc welding, gas welding, brazing, soldering)

Organic chemical processes

- Degreasing, dry cleaning, halogenated hydrocarbons (Solvents)
- Application methods: brushed or sprayed (Paints)
- Benzene, toluene, xylene, n-hexane (Hydrocarbons and their uses)
- Fumigants, spraying, animal dipping (Pesticides)
- Polymer manufacture, rubber manufacture, use of resins in reinforced structures such as glass or carbon fibre, isocyanate forms and uses (Plastics and polymers)
- Handling and use of bioactive materials and asthmagens (Pharmaceuticals and fine chemicals)

Other processes, such as:

- Woodworking
- Biological hazards (animals, farming, water treatment, legionella)

4 Recognition of Physical Hazards (20%)

This section will provide candidates with a basic understanding of the principles of how to recognise physical hazards.

In order to achieve this the candidate will be able to demonstrate a good understanding in the following:

- 4.0.1 An overview of the physics of sound, units of measure and effects noise can have.
- 4.0.2 An overview of the physics of vibration and health effects it may have on the body either locally or as a whole.
- 4.0.3 Human responses to thermal environments (thermal stress) and ways to evaluate it.
- 4.0.4 The electromagnetic spectrum and various bands of non-ionizing radiation, such as ultraviolet, infra-red, microwave, lasers etc.
- 4.0.5 The assessment of lighting and in the workplace and the effects of poor lighting and glare.
- 4.0.6 The health effects of ionizing radiation, assessment of exposure, control techniques and specialist roles of those who deal with it.

- 4.0.7 Musculoskeletal injuries, ergonomics, and the role of an ergonomist.
- 4.0.8 The hazards associated with using Display Screen Equipment and how they should be managed.
- 4.0.9 Stress and stress management in the workplace.

5 Evaluation of Hazards (20%)

This section will provide candidates with a basic understanding of the principles of assessing exposure for different types of hazards.

In order to achieve this the candidate will be able to demonstrate their understanding in the following:

- 5.0.1 An introduction to exposure assessment, measurement of gases, vapours, and dusts:
- Measurement of vapours, gases, aerosols, and dust using sampling techniques such as, personal, static, real time and spot sampling
 - Analytical methods
 - Hygiene standards and occupational exposure limits
 - Units of measurement, time-weighting, simple calculations/algebra
 - Compliance with statutory limits
 - Standard setting
 - Biological monitoring and health surveillance
- 5.0.2 An introduction to exposure assessment of physical hazards such as:
- Measurement of noise
 - Measurement of thermal environment
 - The principles of assessment of vibration
 - The principles of assessment of lighting and non-ionising radiation
 - The principles of assessment of ionising radiation
 - The principles of ergonomic risk assessment

6 Control of Hazard (20%)

This section will provide candidates with a basic understanding of the principles of different types of hazard control measure.

In order to achieve this the candidate will be able to demonstrate their understanding in the following:

- 6.0.1 An introduction to and outline of main elements within the hierarchy of control such as:
- Elimination or substitution of a hazard
 - Basic principles of ventilation (local and general)
 - Local exhaust ventilation (LEV) design
 - Personal protection (PPE, RPE, hearing protection etc.)
 - General ventilation and air conditioning

Suggested References and Further Reading

- (1) The Health and Safety at Work Act.
- (2) The Management of health and Safety at Work Regulations
- (3) The structure of UK health and safety legislation
- (4) The basic structure of the Health and Safety Executive including the relationship with WATCH and ACTS
- (5) Control of Substances Hazardous to Health Regulations (COSHH)
- (6) Control of Noise at Work Regulations
- (7) Control of Asbestos at Work Regulations
- (8) Control of Vibration at Work Regulations
- (9) Integrated Pollution Prevention and Control [IPPC] Regulations
- (10) Monitoring Health Hazards at Work
- (11) Principles of Occupational Health Hygiene

Course Length

This course will require at least **36** hours of study time, which includes approximately 30 hours of teaching and practical assessment including final examination and approximately 6 hours of independent study, such as revision (in the candidates' own time).

Examinations and Assessment

Written Examination

This is an open-book multiple choice examination comprising of **40** questions (**40** marks) to be answered in **1** hour.

The examination covers all sections of the syllabus and is overseen by an invigilator.

The pass mark for this examination is **60%**.

Certification

Candidates who pass the examination within 12 months of undertaking the course will be awarded the: '**M200 - Basic Principles in Occupational Hygiene**'