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## **Fluid Flow Dynamics in Mine Environmental Control**

R16,241.23

Including VAT

### **Aims of the Course**

The aim of the course is to introduce students to broad themes and concepts relating to mine ventilation and how to engage with these critically. In particular the students will be introduced to the scientific principles relevant to all related engineering aspects around air flow dynamics including the use of instruments, air pollution aspects and water reticulation including energy recovery systems, pump systems, mine ventilation and the planning and implementation of mine ventilation systems in particular the design, application of fan formulae applicability of different types of fans.

### **Course Content**

The course will include: Natural ventilation, shock-losses, airflows in series and parallel air ways, pressure loss calculations, Atkinson's equation and friction factors, fundamental principles of airflow, parameters and compressibility limits, regulators, theory of fans, fan characteristics and fan selection.

### **Learning Outcome**

After completion of this course students should be able to:

- Use engineering methods, skill and tool to solve air flow ventilation problems.
- Understand air and water flow in mine ventilation .
- Apply mathematical, scientific and engineering knowledge relating to air flow dynamics
- Communicate complex ideas in a variety of formats to diverse audiences relating to air flow dynamics.

### **Method of Assessment**

Successful completion of an exam (70%) and assessment (30%).

**Number of Notional Study Hours: 100**

## **Mathematics for Mine Environmental Control**

R16,241.23

Including VAT

### **Aims of the Course**

The aim of the course is to introduce students to broad themes and concepts relating to mathematical concepts used in mine ventilation.

### **Course Content**

The course will include: averages, percentages, interpolation and reciprocals, rule of signs, ratio and proportion, indices, powers roots and brackets, areas, perimeters and volumes, manipulation of formulae.

### **Learning Outcome**

At the end of the course the delegate should be able to perform mathematical calculations to solve ventilation problems involving air flow calculations, distribution and control of air flow, air pressures, heat calculations, psychometry calculations and problem solving related to refrigeration.

### **Method of Assessment**

Successful completion of an exam (70%) and assessment (30%)

**Number of Notional Study Hours: 100**

# **Principles of Thermal Engineering in Mine Environmental Control**

R16,241.23

Including VAT

## **Aims of the Course**

The aim of the short course is to give the students an understanding of the different types of temperatures and the influence of water vapour on temperatures, heat transfer processes, psychrometric properties of air, air volume requirements and refrigeration principles.

## **Course Content**

The content of the course will include the following:

- Review of basic thermodynamics
- Introduction to psychrometrics
- Heat transfer and sources of heat in mines
- Managing heat flux in mining excavations
- Mine cooling principles
- Ventilation planning principles and practice
- Mixing of airstreams
- Theory and calculation of auto compression and Virgin Rock Temp (VRT)

## **Learning Outcome**

After completion of the course, delegates should be able to:

- Use engineering methods, skill and tool to solve ventilation problems relating to heat psychrometric processes and refrigeration issues.
- Identify natural and artificial sources of heat.
- Use empirical methods to estimate heat load and cooling required.
- Recommend appropriate cooling methods for various mine situation.

# Method of Assessment

Successful completion of an examination (70%) and assessment (30%).

**Number of Notional Study Hours: 100**

## **Risk Management, Fire and Explosions, Gases and Statistics in Mine Environmental Control**

R16,241.23

Including VAT

## **Aims of the Course**

The aim of this module is to introduce students to principles of risk management, fire and explosion prevention techniques, gases and the measurement of gas concentrations and statistics such as desirable properties of descriptive statistics.

## **Course Content**

The content of the course will include the following:

- Risk management principles and definitions with specific reference to the occupational hygiene process and to the anticipation, recognition, evaluation and control of occupational health hazards.
- The different components of fires and the design of a fire management system and prevention plan.
- The properties of various hazardous materials.
- Risk assessment tools.
- The design and positioning of passive and active explosion barriers.
- The calculation of flammable gas concentrations and dilution volume flow rate as well as the issuing and calibration of gas measuring instruments.
- The description and properties of descriptive statistics.

# Learning Outcome

After completion of this course students should be able to:

- Understand the principle of risk management with particular emphasis to occupational hygiene processes
- List and describe components of fires, design a fire management and prevention plan and discuss the properties of various hazardous materials and explain the design of active and passive explosion barriers.

## Method of Assessment

Successful completion of an exam (70%) and assessment (30%).

**Number of Notional Study Hours: 100**

## Occupational Hygiene in Mine Environmental Control

R16,241.23

Including VAT

## Aims of the Course

The aim of this course is to give students an understanding of the role of occupational hygiene and health related to mine environmental control.

## Course Content

The content of the course will include the following:

- Provide an understanding of the meaning of occupational hygiene and the demonstration of the relationship between an occupational hygienist and allied relationships.
- The importance of occupational hygiene and the role of the occupational hygienist in mines and plants.
- Understand and use of occupational hygiene exposure limits.

- Standards that make up an occupational health management system.
- Conducting an occupational hygiene audit.
- Airborne pollutants and chemical stresses, physical agents and biological hazards.
- Evaluation of risks and the management and control of occupational health risks.

## **Learning Outcome**

After completion of the course, students should be able to:

- Demonstrate the relationship between an occupational hygienist and allied relationships.
- Identify standards that make up an occupational health management system.
- Conduct an occupational hygiene audit.

## **Method of Assessment**

Successful completion of an exam (70%) and assessment (30%).

**Number of Notional Study Hours: 100**

## **Legislation for Mine Environmental Control**

R16,241.23

Including VAT

## **Aims of the Course**

The aim of this module is to give the students a practical understanding of the relevant legislation with which the mine environmental control officer deals on a daily basis.

## **Course Content**

The content of the course will include the following:

- Practical application of the Mine Health and Safety Act.
- Knowledge of the Occupational Health and Safety Act and Asbestos Regulations 2001, and Lead Regulations 2001.
- Knowledge of the guideline for the Compilation of Mandatory Codes of Practice relating to various subjects such as flammable gas and coal dust explosions in collieries and other than coal mines, exposure to airborne pollutants, thermal stress noise, cyanide management and trackless mobile machinery.

## **Learning Outcome**

After completion of the course, the students should be able to:

- Apply the knowledge of the Mine Health and Safety Act and relevant regulations.
- Apply the knowledge of the relevant guidelines for the compilation of mandatory codes of practice issued by the Department of Mineral Resources

## **Method of Assessment**

Successful completion of an exam (70%) and assessment (30%).

**Number of Notional Study Hours: 100**

# Wits MEC qualification in collaboration with MVSSA

🕒 April 6, 2018   📧 Notices   👤 Madelein TerreBlanche

We are pleased to announce that the **Wits MEC qualification** in collaboration with MVSSA, is available on the Wits Enterprise website and open for students to register.

Please see the links below for more information.

1. Fluid Flow Dynamics in Mine Environmental Control: <https://wits-enterprise.co.za/c/fluid-flow-dynamics-in-mine-environmental-control>
2. Mathematics for Mine Environmental Control: <https://wits-enterprise.co.za/c/mathematics-for-mine-environmental-control>
3. Principles of Thermal Engineering in Mine Environmental Control: <https://wits-enterprise.co.za/c/principles-of-thermal-engineering-in-mine-environmental-control>
4. Risk Management, Fire and Explosions, Gases and Statistics in Mine Environmental Control: <https://wits-enterprise.co.za/c/risk-management-fire-and-explosions-gases-and-statistics-in-mine-environmental-control>
5. Occupational Hygiene in Mine Environmental Control: <https://wits-enterprise.co.za/c/occupational-hygiene-in-mine-environmental-control>
6. Legislation for Mine Environmental Control: <https://wits-enterprise.co.za/c/legislation-for-mine-environmental-control>







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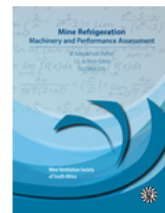
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**Mine Refrigeration  
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**R360.00**

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