

Mine Ventilation

PROFESSIONAL CERTIFICATE



Gain practical and theoretical insights into the design, measurement and planning of underground ventilation systems with the goal of improving safety and efficiency.

Course overview

Mine ventilation is the lifeblood of safe, efficient underground operations. It delivers fresh air, dilutes contaminants, controls heat and humidity, and prevents the build-up of flammable or toxic gases — making it one of the most critical safety systems in any underground mine.

The Professional Certificate in Mine Ventilation equips engineers, safety professionals, and mine managers with the practical capability to design, measure, plan, and optimise underground ventilation systems. Developed and delivered by industry experts, including J. Daniel Stinnette — with nearly three decades of experience across 150+ mines, tunnels, and underground facilities on six continents — this course goes beyond theory to give you the applied knowledge required in demanding, real-world environments.

- ✓ Flexible for FIFO and shift-based rosters
- ✓ For ventilation and mining engineers, safety teams, and mine managers
- ✓ Suitable for coal and metalliferous underground mining worldwide
- ✓ Access to Ventsim™ software included as part of the course

Why this course matters

Ventilation is typically the single largest operational energy cost in an underground mine — often accounting for 30–50% of total electricity consumption. Yet it is also the most fundamental safety system keeping underground workers alive. When ventilation fails, the consequences are measured not in downtime or repair costs, but in lives.

This course provides the foundation to:

- Design ventilation systems that are safe, efficient, and suited to real operating conditions
- Understand how airflow, contaminants, heat, and network behaviour interact underground
- Model and simulate ventilation networks to test decisions before implementation
- Identify and avoid the most common and costly ventilation errors in the industry
- Engage confidently in ventilation planning, audits, and regulatory compliance



PD HOURS

PD hours

40 hours



Delivery

100% online



Duration

8 weeks



Certificate

Digital credential

Pricing

Professional Certificate

Member \$2,940

Non-member \$3,810

Prices are in Australian dollars and are inclusive of 10% GST

Discounts available when 3 or more participants book together.

Scan for more
information

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Who should enrol?

This course is purpose-built for professionals who are directly or indirectly responsible for underground ventilation systems, including:

- Mine ventilation engineers and ventilation officers
- Mining engineers (graduate through senior) new to ventilation or seeking to strengthen core principles
- Safety and occupational health professionals managing ventilation compliance
- Mine managers, superintendents, and technical services professionals
- Environmental and regulatory professionals overseeing ventilation and air quality standards
- Mining consultants and researchers deepening expertise in ventilation design

Ideal for professionals across Australia, Africa, Asia, and the Americas, where underground mining demand, depth, and regulatory complexity are increasing

What you'll learn

- Ventilation Fundamentals & Airflow Dynamics
- Airborne Contaminants: Dust, Gases & DPM
- Bulk Air Heating, Cooling & Heat Stress Management
- Metal/Non-Metal & Coal Mine Ventilation System Design
- Ventilation Network Planning & Simulation

Career outcomes

- Design and optimise underground ventilation systems for coal and metalliferous mines
- Proactively identify and resolve ventilation failures before they escalate to incidents
- Apply simulation tools to evaluate system performance and support planning decisions
- Contribute confidently to ventilation audits, compliance, and investment reviews
- Communicate ventilation risks and requirements clearly to management and operations teams
- Strengthen your technical profile in mine safety, engineering, and operational leadership

Organisational benefits

- Structured capability development for engineers and safety professionals in ventilation roles
- Reduced risk of ventilation failures, regulatory breaches, and costly incident investigations
- Improved safety outcomes through hazard-aware system design and proactive risk management
- Stronger operational planning with ventilation integrated into mine scheduling from the outset
- A scalable, repeatable training solution for multi-site and global operations
- Reduced long-tail occupational health liability through better DPM and dust management
- Capability uplift for regions with limited access to structured ventilation training

Facilitators

See full facilitator profiles on our course page.



Dr Nikky LaBranche

FAusIMM (CP)
Dust and Respiratory Health Program
Lead, University of Queensland



J. Daniel Stinnette

Founder and President,
Ventilation Innovation

Design safer mine systems. Eliminate preventable failures. Become the ventilation professional your operation depends on.

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Mine Ventilation modules

1

Introduction to underground mine ventilation

- What mine ventilation is and why it matters
- Fundamental theories of mine ventilation
- Airflow dynamics concepts
- The vocabulary of mine ventilation

2

Airborne contaminants (dust, gases, DPM)

- Common contaminant types
- Effective mitigation strategies
- Regulatory limits and architecture
- Monitoring and control

3

Bulk air heating and cooling

- Heat stress and cold stress
- Theory of bulk air heating (thermodynamics)
- Theory of bulk air cooling
- Cooling system performance and technology

4

Metal/non-metal mine ventilation system design

- Key parameters impacting M/NM ventilation design
- Primary vs secondary auxiliary systems
- Ventilation control and airflow determination
- Common hazards and mitigation techniques

5

Coal mine ventilation system design

- Key parameters for coal mine ventilation
- Common coal mine ventilation systems
- Utilisation of airflow and volumetric efficiency
- Common hazards, mitigation and surveys

6

Ventilation network planning and simulation

- Theories and strategies of ventilation simulation
- Practical model construction
- Ventilation simulation for mine planning
- Example problem project (M/NM and Coal)