Engineering Institute of Technology.

52892WA Advanced Diploma of Electrical and Instrumentation (E&I) Engineering in Mining

12:30 PM - 1:30 PM UTC+0

Watch Webinar Recording Here

Presented by:
Ian Verhappen
Co-author and leading Project Engineering Professional

Event Conduct

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Introduction – Presenter

Ian Verhappen, Co-author and leading Project Engineering Professional

Ian has worked in digital communications since 1994 and led the first multi-vendor Foundation Fieldbus project in 1996. He has been an instructor with EIT for several decades sharing his extensive experience across industries including mining, oil and gas, water, food processing and petrochemicals.

He is the co-author of ISA's "Foundation Fieldbus Pocket Guide" and active in international standards development, currently serving as Canadian representative to the IEC Standards Management Board, chair of IEC SC65C Industrial Networks, and convenor of several IEC Working Groups.

Known for his passion for digital communications, Ian has over 20 years of oil-sands mining experience and is recognized for explaining complex technology in simple, practical terms.

AGENDA

1. Study Modes
2. Graduate Key Outcomes
3. Program details
4. Learning Outcomes
5. Entry Requirements
6. Fees & Payments
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11. Case Study
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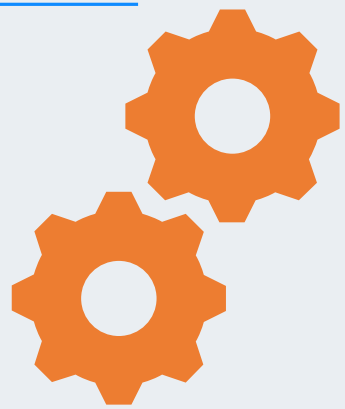
52892WA Advanced Diploma of Electrical and Instrumentation (E&I) Engineering in Mining*

This 18-month advanced, industry-oriented advanced diploma is delivered online and equips students with skills in the latest electrical and instrumentation technologies in mining, practical guidance from experts in the field and a world-class Advanced Diploma of Electrical and Instrumentation (E&I) Engineering in Mining.

This qualification is officially accredited under the Australian Qualifications Framework, and EIT is approved by the Australian Skills Quality Authority (ASQA) for delivery to students worldwide.

Find out more about country-specific accreditation and professional recognition.

This course is classified as Level 6 under the Australian Qualifications Framework (AQF).



* VSL approved course, maximum tuition fee for Australian students: AUD $12,112.00

Fields of Engineering

Industrial Automation, Instrumentation and Process Control Courses

Mechanical Engineering Courses

Electrical Engineering Courses

Civil Engineering Courses

Study Modes: Online Delivery

At EIT, online study is a unique experience.

You'll receive:

- Live, interactive tutorials led by our global expert lecturers;
- Support from our dedicated Learning Support Officers who guide you every step of the way;
- Hands-on technology through the use of remote and virtual laboratories, and simulation software.

Our unique personalized synchronous delivery methodology encourages you to advance your technical and technological knowledge, while forming global networks and balancing life and work commitments.

Program Details

Graduates will have the knowledge and skills to contribute to the capacity of electrical and instrumentation engineering and applicable industries to maintain their competitiveness in a global marketplace through the application of the latest technologies, value-adding to existing products, processes and services and the development of new, sustainable and innovative solutions.

Four threads run through the program to provide maximum functional coverage in the field of electrical and instrumentation engineering as applied to mining. These threads comprise of electrical power engineering, communications engineering, control engineering, plus analytics and safety management systems.

Upon completion, students should be able to:

- Recognize and apply the fundamentals of electrical engineering and process engineering in a variety of mining industries
- Interpret electrical drawings, documentation and schematics
- Identify and explain the fundamental features of power distribution, cabling and protection in mining applications

Learning Outcomes:

- Recognize and apply the fundamentals of electrical engineering and process engineering in a variety of mining industries
- Interpret electrical drawings, documentation and schematics
- Identify and explain the fundamental features of power distribution, cabling and protection in mining applications
- Recognize and apply a broad range of industrial data communication concepts and equipment applicable to mining
- Identify the risks associated with electric equipment in hazardous areas
- Manage the efficient and safe operation of a wide range of electrical and instrumentation equipment
- Interpret the basic principles of SCADA and Distributed Control Systems in the context of mining operations
- Interpret the basic features of process control and associated plant instrumentation in the context of mining operations
- Apply the principles required for operation, maintenance and troubleshooting of mining instrumentation
- Identify and analyze contemporary issues in electrical and instrumentation engineering practice
- Identify and suggest solutions to problems with SCADA, radio telemetry, wireless network, satellite network, and fieldbus systems

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Program Structure – 18 Months

Module Number	Module Name	Duration
DEEEDR605	Electrical Drawings	3 Weeks
DCSBME604	Use Basic Mathematics in Engineering	6 Weeks
DEIFEP601	Fundamentals of Electrical Engineering and Power Distribution	6 Weeks
DMNCBS603	Circuit Breakers and Switchgear in Mining	5 Weeks
DEEPSP611	Power System Protection	5 Weeks
DMNMTC606	Motor Control	4 Weeks
DMNDCO607	Data Communications	4 Weeks
DMNETH608	Ethernet	3 Weeks
DMNTCP609	TCP/IP and VoIP	3 Weeks

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Program Structure – 18 Months

Module Code	Module Title	Duration
DMNTMS610	Terrestrial Microwave and Satellite Communications	3 Weeks
DMNLFS611	Leaky Feeder Systems	2 Weeks
DMNWLA612	Wireless LANs and Mesh Networks	5 Weeks
DEIFPI602	Fundamentals of Process Instrumentation	6 Weeks
DMNFBU614	Fieldbuses	3 Weeks
DMNSCD615	SCADA, Data Acquisition and OPC	4 Weeks
DEIPCB613	Process Control Basics	5 Weeks
DIAPLC610	Programmable logic controllers	3 Weeks
DMNDCS618	Distributed Control Systems	2 Weeks
DMNPSS619	Personal Safety Systems	2 Weeks

Entry Requirements

Applications are considered on a case-by-case basis and the following minimum entry requirements are to be strictly adhered to:

- Applicants must have at least a Year 12 or Cert III trade qualification or equivalent in a related field;

AND

- They must have at least 2 years' work experience in a related field

OR

- At least 4 years' work experience in a related field – subject to acceptance of an application for Credit to Entry

AND

- Satisfactory English language proficiency at an English pass level in a Senior Certificate of Education or equivalent;

OR

- A specified level of achievement in a recognised English language test such as: IELTS (or equivalent) at a score of at least 5.5 (with no individual band score less than 5.0); or equivalent;

OR

- Satisfactory completion of another course offered by EIT, or by another tertiary institution, in English.

Fees & Payments

For full current fees in your country visit the Fees page.

VET Student Loan (VSL) Program is available for this course:

*VSL approved course, maximum tuition fee for Australian students: AUD $12,112.00

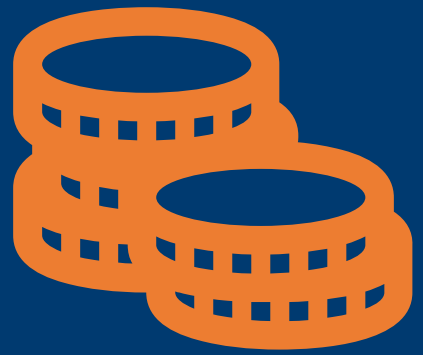
This means eligible students can use a VET Student Loan to pay their tuition fees up to a maximum loan cap amount, to be repaid through the Australian Taxation System.

If you have been approved for a VET Student Loan, the borrowed amount will be incurred as a debt that is repayable to the Commonwealth government.

Click here to learn more about your eligibility and applying for VET Student Loan (VSL) on this course.

Payment Methods

Learn more about payment methods, including payment terms & conditions and additional non-tuition fees.



Potential Job Outcomes

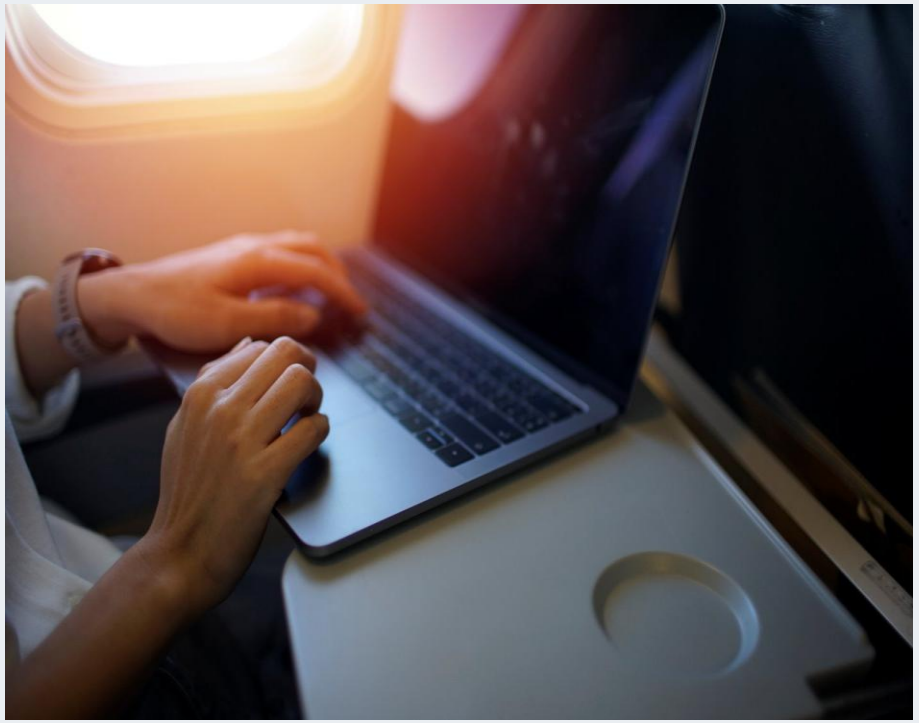
Potential job roles include:

- Electrical and Instrumentation Engineering Technician
- Instrumentation Specialist
- Automation Engineering Specialist
- Control Engineering Consultant
- Control Systems Technologist
- Instrument Mechanic
- Process Analyzer
- Energy Technologists
- Operations Manager
- Development & Testing Technician
- Signal Processing Technician
- Electrical & Instrumentation Project Engineer

Software Used

This course may use the following software:

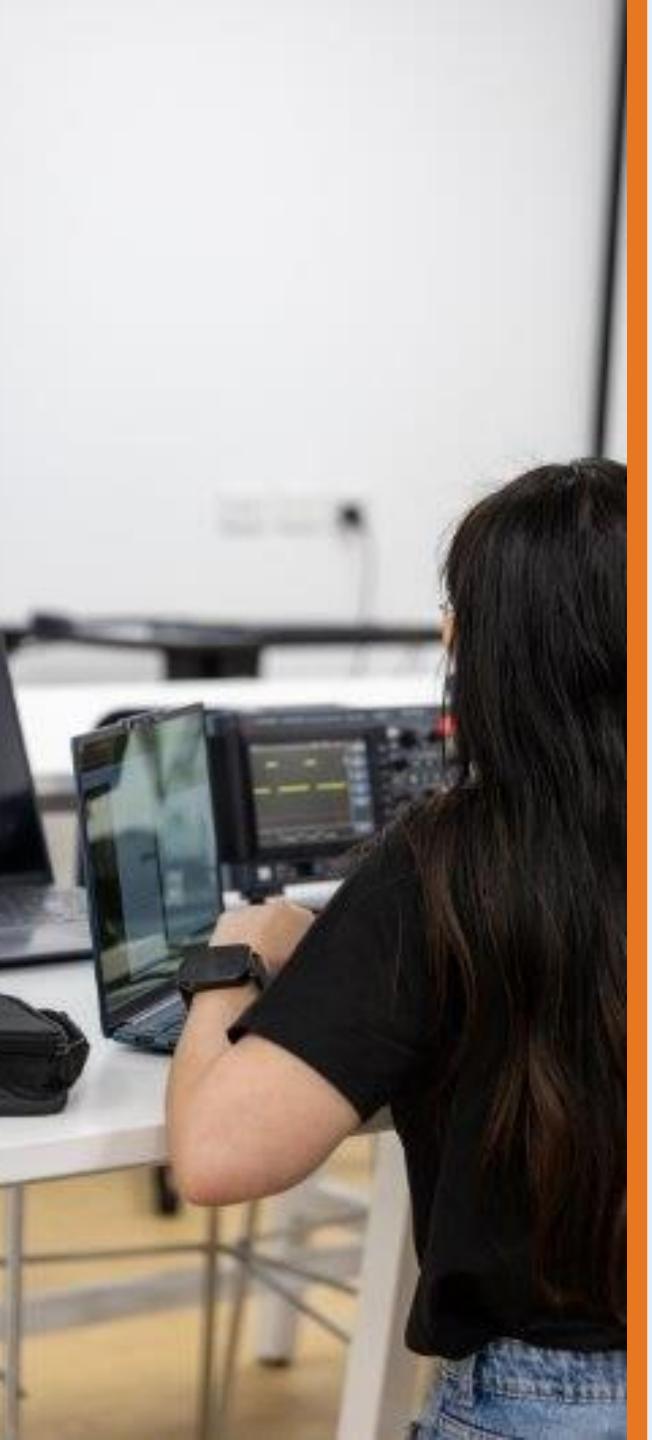
- AutoCAD
- Citect
- Codesys
- DeviceNet Manager
- EasyPower
- Excel
- FreeCAD
- Geogebra
- OPC Client
- PC-Control LAB3
- PicoScope
- Prop-4Vp (Spreadsheet)
- SMARTDRAW
- VPLabs
- Wireshark



Due to ongoing unit and course reviews, software may change from the list provided. Learn more about the Practical Learning at EIT here.

Time Commitment & Duration

- You are **expected to spend approximately 10-15 hours per week attending live webinars**, learning the program material, and completing assessments. This includes attending weekly webinars that run for about 90 minutes to facilitate class discussion and allow you to ask questions.
- This program has a **70% attendance requirement** in the live webinars in order to graduate from the program. If you are unable to attend the live webinars, you have the option of watching the recording of completed webinars and sending a summary of what you have learned from the webinar to the Learning Support Officer. The summaries go towards your attendance requirement for the program.
- This program is run online and has been designed to fit around full-time work. It **will take 18 months to complete.**
- We understand that sometimes work commitments and personal circumstances can get in the way of your studies, so if at any point you feel that you are struggling with the pace of the course or finding a particular unit/module challenging, you are encouraged to contact your designated Learning Support Officer for assistance.



Student Support

Students need support, encouragement, and a go-to person. Our students are supported by dedicated Learning Support Officers (LSOs) for the duration of their studies, giving them a greater chance of success.

They provide guidance on non-content related information such as:

- Live tutorial information
- Assessment dates, times and extensions
- Grades
- Health and wellbeing information

Remote and Virtual Labs

When studying at EIT, students complete practical exercises using a combination of remote and virtual laboratories and simulation software.

Practical Experience

In these remote and virtual laboratories students can control physical equipment and sensors equivalent to the traditional university engineering lab.

1. Traditional, physical labs at a distance, but operating in real time.
2. Accurate representation of current industry hands-on practices.
3. The interface to equipment is digital and data-driven.
4. High availability and asynchronous – anytime.
5. Access to specialized equipment in a safe and near-limitless testing environment.
6. Diverse student cohorts.
7. Bandwidth requirements can be demanding.
8. Support

Engineering Institute of Technology.

Case Study

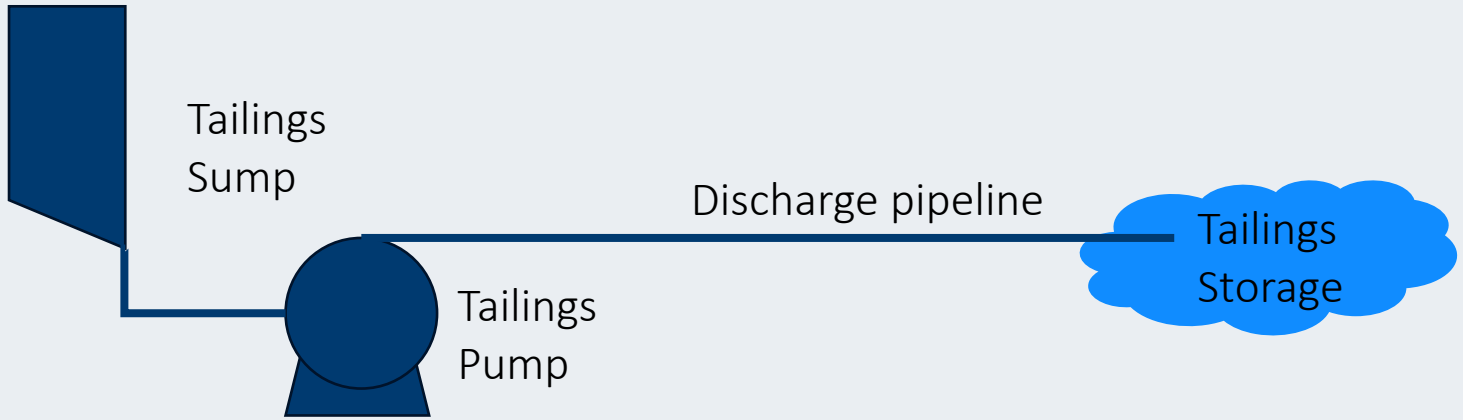
Tailings Pump

Mining Tailings

Almost every mining operation needs to manage tailings to ensure their containment and management. To do this, tailings slurry is pumped from the processing plant to a tailings storage facility.

The system includes slurry pumps, motor starters or VSDs, pressure transmitters, flow measurement, sump level measurement, vibration monitoring, and SCADA alarms.

Operating conditions are harsh: abrasive slurry, variable density, vibration, chemical exposure, and potential pipeline blockages.



Representative Risks

Risk	Likely Cause	E&I Controls / Mitigation
Pump cavitation	Low sump level or suction restriction	Low-level trip, suction pressure monitoring, operator alarm
Pipeline blockage	Settling solids or high slurry density	Flow/pressure trending, high-pressure alarm, flushing procedure
Pump mechanical failure	Abrasion, imbalance, bearing wear	Vibration monitoring, motor current trend, maintenance trigger
Tailings overflow	Pump trip or poor level control	Redundant level measurement, high-high level alarm, standby pump
Instrument failure	Pump trip or poor level control	Non-intrusive or protected instruments, inspection plan

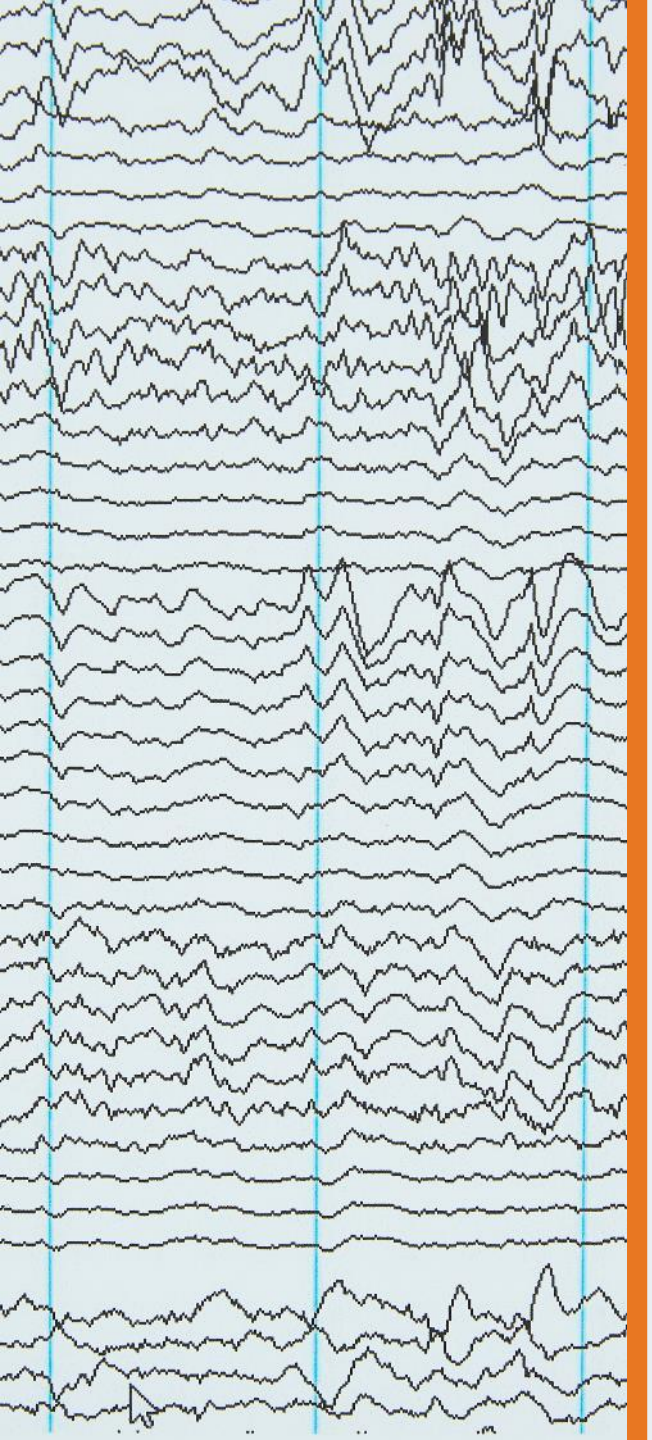
Potential Problem Scenario

Symptoms observed:

- Rising discharge pressure
- Reduced or unstable flow
- Increasing pump vibration
- Frequent sump high-level alarms
- Operator reports of intermittent pipeline surging

Possible causes:

- Partial pipeline blockage
- Increased slurry density
- Pump wear or impeller degradation
- Cavitation or poor suction conditions
- Faulty or poorly located instrumentation



Diagnostic Approach

Diagnostic sequence:

1. Confirm sump level trend and pump running status.
2. Compare motor current, pump speed, discharge pressure, and flow.
3. Check whether pressure is rising while flow is falling.
4. Review vibration trend for pump mechanical condition.
5. Inspect likelihood of pipeline blockage, valve position issue, or slurry density change.
6. Validate whether the instruments are credible in slurry service.

Potential E&I Responses

1. Improve measurement coverage:
- Non-intrusive flow measurement where practical
- Suction and discharge pressure monitoring
- Sump level measurement suitable for turbulent slurry service
- Pump vibration and motor current trending

2. Improve control:
- Alarm rationalization for pressure, level, vibration, and motor load
- Interlocks for low suction level, high discharge pressure, and pump overload
- Trend-based maintenance triggers

3. Improve operations:
- Operator diagnostic checklist
- Preventive maintenance plan
- Review of instrumentation placement and slurry compatibility

Accurate pressure, flow, level, equipment health, and pipeline integrity monitoring supports safer, more efficient tailings operation and can help reduce unplanned downtime and environmental risk.

Engineering Improvements

Good instrumentation, control logic, and maintenance strategy reduce operational risk.

Representative improvements:

- Fit-for-service instrumentation
- Proper transmitter location and isolation
- Condition monitoring
- Alarm rationalization
- SCADA trending
- Preventive maintenance
- Operator response procedure

Advanced monitoring and control of pressure, flow, level, and equipment health can help operators maintain slurry flow, detect pump anomalies, reduce wear, and manage safety/environmental risk

Thank You!

Upcoming Course

Engineering Institute of Technology (EIT)	Start Date
52892WA Advanced Diploma of Electrical and Instrumentation (E&I) Engineering in Mining	1 September 2026

Q&A

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